

**UTILITY  
PATENT APPLICATION  
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 862.C1923

First Named Inventor or Application Identifier

KATSUTOSHI USHIDA

Express Mail Label No.

**APPLICATION ELEMENTS**

See MPEP chapter 600 concerning utility patent application contents.

1.  Fee Transmittal Form  
(Submit an original, and a duplicate for fee processing)

2.  Specification Total Pages 121

3.  Drawing(s) (35 USC 113) Total Sheets 13

4.  Oath or Declaration Total Pages 1

a.  Newly executed (original or copy)

b.  Unexecuted for information purposes

c.  Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 17 completed)  
**[Note Box 5 below]**

i.  **DELETION OF INVENTOR(S)**

Signed Statement attached deleting  
inventor(s) named in the prior application, see  
37 CFR 1.63(d)(2) and 1.33(d).

5.  Incorporation By Reference (useable if Box 4c is checked)

The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4c, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

**ADDRESS TO:** Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

6.  Microfiche Computer Program (Appendix)

7. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)

a.  Computer Readable Copy

b.  Paper Copy (identical to computer copy)

c.  Statement verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

8.  Assignment Papers (cover sheet & document(s))

9.  37 CFR 3.73(b) Statement  
(when there is an assignee)  Power of Attorney

10.  English Translation Document (if applicable)

11.  Information Disclosure Statement (IDS)/PTO-1449  Copies of IDS Citations

12.  Preliminary Amendment

13.  Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)

14.  Small Entity  Statement filed in prior application  
Statement(s) Status still proper and desired

15.  Certified Copy of Priority Document(s)  
(if foreign priority is claimed)

16.  Other: \_\_\_\_\_

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

Continuation  Divisional  Continuation-in-part (CIP) of prior application No. \_\_\_\_/\_\_\_\_\_

**18. CORRESPONDENCE ADDRESS**

<input checked="" type="checkbox"/> Customer Number or Bar Code Label	05514 (Insert Customer No. or Attach bar code label here)			or <input type="checkbox"/> Correspondence address below
NAME				
Address				
City	State	Zip Code		
Country	Telephone	Fax		

+

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	100-20	80	X \$ 18.00 =	\$1440.00
	INDEPENDENT CLAIMS (37 CFR 1.16(b))	26-3 =	23	X \$ 78.00 =	\$1794.00
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			\$260.00 =	0
				BASIC FEE (37 CFR 1.16(a))	\$ 690.00
				Total of above Calculations =	\$3924.00
	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
				TOTAL =	\$3924.00

19. Small entity status

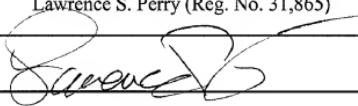
- A Small entity statement is enclosed
- A small entity statement was filed in the prior non-provisional application and such status is still proper and desired.
- Is no longer claimed.

20.  A check in the amount of \$3924.00 to cover the filing fee is enclosed.

21.  A check in the amount of \$40.00 to cover the recordal fee is enclosed.

22. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06-1205:

- Fees required under 37 CFR 1.16.
- Fees required under 37 CFR 1.17.
- Fees required under 37 CFR 1.18.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED	
NAME	Lawrence S. Perry (Reg. No. 31,865)
SIGNATURE	
DATE	June 6, 2000

TITLE OF THE INVENTION

COMMUNICATION APPARATUS, COMMUNICATION METHOD,  
COMMUNICATION SYSTEM, AND STORAGE MEDIUM

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FIELD OF THE INVENTION

The present invention relates to a communication apparatus, communication method, communication system, and storage medium capable of communicating e-mail data  
10 and G3/G4 facsimile data.

BACKGROUND OF THE INVENTION

G3 facsimile apparatuses based on ITU-T Recommendations T.30 exchange functional information  
15 pertaining to the capabilities of the apparatuses, e.g., a recording resolution, a printable main scan length, a sub-scan length, a coding scheme, a modulation scheme, a transmission rate, a sub-address, a password, and selective polling, by using DIC/DTC/DCS before  
20 transmission of documents. Therefore, if the functions of transmitting and receiving apparatuses are different, facsimile documents can be communicated by an optimum image format and communication method which both apparatuses have. Furthermore, facsimile services such  
25 as relay, broadcast, and polling can be performed by

using the functions of sub-address, password, and selective polling.

To examine information about the result of communication performed by a facsimile apparatus, a 5 communication result report shown in Fig. 12 is prepared. In facsimile communication, whether the communication is normally or abnormally terminated is known when the communication line is disconnected. Hence, a communication result is determined when a 10 communication result report is output.

In communication apparatuses for communicating e-mail data, however, no means for exchanging information pertaining to such facsimile functional information is defined. Also, in e-mail data 15 communication, no means for transmission acknowledgement (transmission result discriminating means) for indicating that transmission is reliably performed is defined.

Accordingly, to transmit e-mail by attaching 20 facsimile-format image data, the general approach is to attach an image of a format, which is a base line (a minimum necessary function which a facsimile apparatus based on the ITU-T recommendations must have as 25 essential capability) of G3 facsimile, to e-mail as image data of a TIFF format (a file format concerning raster image data developed by Aldus) by using, e.g.,

MIME or SMIME (an e-mail data format recommended by IETF). A coding scheme of the base-line image format is MH coding, its main scan resolution is 8 pels/mm, its sub-scan resolution is 3.85 lines/mm, and its  
5 original width is A4 208 mm.

If, therefore, the transmitting end transmits e-mail by attaching image data having higher resolutions, such as a main scan resolution of 16 pels/mm and a sub-scan resolution of 15.4 lines/mm,  
10 than the base line or by attaching image data of a large sheet size such as A3, it is unknown that the destination apparatus can process the received data. This makes it impossible to know whether the other party has reliably received the document.

15 Furthermore, since no means for communicating functional information concerning G3/G4 facsimile services is defined, facsimile services such as relay, broadcast, and polling cannot be used via e-mail communication.

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#### SUMMARY OF THE INVENTION

The present invention has been made in consideration of the above situation, and the first object according to the present application is to  
25 provide, in a communication apparatus capable of communication in an e-mail form, means for exchanging

information pertaining to functional information with  
the other party, image data converting means, and  
delivery confirmation exchanging means by using optimum  
means in accordance with the forms of connections to  
5 the Internet of apparatuses at both transmitting and  
receiving ends and with the installation state of an  
e-mail server, thereby realizing image data  
communication, equivalent to facsimile communication  
using a public (wide area) network, on e-mail  
10 communication.

It is the second object according to the present  
application to provide a user-friendly apparatus  
capable of transmitting image data by a base-line  
function even when the other party is an apparatus  
15 incapable of exchanging functional information on  
e-mail communication or even when functional  
information cannot be exchanged owing to, e.g.,  
abnormality of a server or a network.

It is the third object according to the present  
20 application to perform common facsimile communication  
by using a public line, by giving up communication  
using the Internet, if functional information is  
unexchangeable with the other party, thereby realizing  
communication considering the maximum capability of the  
25 other party even when the other party is unable to  
exchange functional information on e-mail communication.

It is the fourth object according to the present application to reliably transmit image data even when an error occurs on e-mail communication and change the number of times of retransmission in accordance with 5 the contents of the error, thereby accomplishing reliable distribution of e-mail data.

It is the fifth object according to the present application to improve the performance of an apparatus by performing no retransmission if retransmission is 10 meaningless such as when the contents of delivery confirmation indicate a communication error due to the absence of a corresponding address.

It is the sixth object according to the present application to reliably inform the partner on e-mail of 15 the occurrence of an error by transmitting error information as e-mail data to the destination apparatus or to the designated e-mail address, and to designate the other party to be notified of error information and thereby reliably notify the designated terminal of the 20 error information even when there is no sender at the sending terminal.

It is the seventh object according to the present application to attach information about a transmitted image to e-mail data of error information, thereby 25 allowing a user as a transmission source to readily verify which e-mail data has caused the error.

It is the eighth object according to the present application to improve user friendliness, even when a communication error occurs and the other party is a personal computer incapable of exchanging functional  
5 information, by designating whether transmission by conversion into base-line image data which the other party is most likely to be able to process or retransmission by the same format is to be performed, so that e-mail data is reliably transmitted to the  
10 other party.

It is the ninth object according to the present application to use, as the standards of an image as a base line, MH coding as a base-line coding system, a main scan resolution of 8 pels/mm, a sub-scan  
15 resolution of 3.85 lines/mm, and an original width of A4 208 mm, thereby increasing the probability of success of communication including attached image data, and obtaining communicability with a facsimile apparatus having standard functions.

20 It is the 10th object according to the present application to provide a function with a low communication cost by successively performing communication concerning functional information, communication of the text, and communication concerning  
25 delivery confirmation by a single call, when the charge required to connect to a provider is a fixed amount,

rather than a usage based on the connecting time, or when charging by the provider is based on the number of times of connection.

It is the 11th object according to the present  
5 application to provide a function with a low communication cost by performing communication concerning functional information, communication of the text, and communication concerning delivery confirmation by separate calls, when the charge  
10 required to connect to a provider is based on the connecting time and the functional information communication and the delivery confirmation take time.

It is the 12th object according to the present application to always provide a function with a low  
15 communication cost to a user by allowing the user to selectively perform communication concerning functional information, communication of the text, and communication concerning delivery confirmation by a single call or separate calls.

20 It is the 13th object according to the present application to provide a user-friendly function with a low communication rate by preventing invalid line seizure if there is no response from the other party during communication concerning functional information,  
25 communication of the text, and communication concerning delivery confirmation performed by dial-up connection.

It is the 14th object according to the present application to provide a user-friendly function by permitting a user to selectively perform recall again after the line is once disconnected.

5        It is the 15th object according to the present application to realize communication using an image format as the maximum capability of the other party by forming destination functional information acquired in the past into a database, without requiring functional  
10 information of the destination apparatus whenever communication is performed.

It is the 16th object according to the present application to faithfully transmit image information intended by a user in an intended form by allowing the  
15 user to set whether image data is to be converted for each function such as resolution.

It is the 17th object according to the present application to permit a user to readily designate a function considering the maximum capability of the  
20 other party by displaying functional information corresponding to the address of the other party on the display of an operation panel.

It is the 18th object according to the present application to allow reliable communication with the  
25 other party by performing communication using a public network if a communication error occurs.

It is the 19th object according to the present application to manage functional information in an e-mail server connected by dial-up, thereby allowing a user who uses the Internet by connecting to a provider 5 to communicate image data of e-mail data by the maximum capability of the other party.

It is the 20th object according to the present application to realize efficient processing by omitting, in the case of e-mail data communication, functional 10 information pertaining to unnecessary communication from functional information defined by ITU-T T.30.

It is the 21st object according to the present application to transmit e-mail data, even when a communication error occurs, by converting the e-mail 15 data into image data of a base line which the other party is most likely to be able to process, so that the e-mail data is reliably transmitted to the other party.

It is the 22nd object according to the present application to shorten the whole processing time by 20 omitting the process of exchanging functional information when an image format designated by an operator at the transmitting end is functional information of a base line.

It is the 23rd object according to the present 25 application to use identifiers for relating e-mail concerning functional information pertaining to the

same process, e-mail of the text, and e-mail concerning delivery confirmation to each other, thereby managing the functional information for transmitting the same text and the e-mail for delivery confirmation by  
5 relating them to each other.

It is the 24th object according to the present application to provide delivery confirmation exchanging means in a communication apparatus capable of communication in the form of e-mail, thereby providing  
10 a communication apparatus capable of acknowledgement of communication results, equivalent to facsimile communication using a public network, while examining the features of a network used by a user.

It is the 25th object according to the present application to distinguish, in the case of communication of e-mail data, between communication of a base line not having a function of delivery confirmation information and information representing that the result of communication of image information  
20 is unverified, in accordance with the arrival status of delivery confirmation information.

It is the 26th object according to the present application to distinguish, in the case of communication of e-mail data, between communication of a base line not having a function of delivery confirmation information and result information of  
25

communication having a function of delivery confirmation.

It is the 27th object according to the present application to provide, in a communication apparatus 5 capable of communication in the form of e-mail, a database of information pertaining to the other party and functional information by optimum means in accordance with the forms of connections to the Internet of apparatuses at both transmitting and 10 receiving ends and with the installation state of an e-mail server, thereby realizing image data communication, equivalent to facsimile transmission using a public network, on e-mail communication and enabling rapid communication matching the capability of 15 the other party by omitting the labor of exchanging functional information whenever communication is performed.

It is the 28th object according to the present application to perform communication pertaining to 20 functional information with a registered destination apparatus, when a user registers or updates an e-mail address which he or she frequently uses, such as an e-mail address book function of storing one-touch buttons or abbreviated buttons, destination names, and 25 destination e-mail addresses in one-to-one correspondence with each other, and stores the

communication result in one-to-one correspondence with the registered e-mail address, thereby eliminating the labor of exchanging functional information whenever the text of e-mail is communicated and enabling rapid text 5 communication matching the capability of the other party.

It is the 29th object according to the present application to set whether communication concerning functional information with the destination apparatus 10 is to be performed in accordance with whether the connection to the Internet is dial-up connection or dedicated-line IP connection, thereby reducing the charge when a user connects by dial-up connection.

It is the 30th object according to the present 15 application to register functional information of a base line if it is assumed that the other party is a system not having a function of exchanging functional information, thereby eliminating the labor of exchanging functional information whenever the text of 20 e-mail is communicated and enabling rapid text communication matching the capability of the other party.

It is the 31st object according to the present application to share the contents of a functional 25 information database with another apparatus, thereby eliminating the labor of exchanging functional

information and enabling rapid text communication matching the capability of the other party.

It is the 32nd object according to the present application to always share the latest contents of a functional information database with another apparatus by transferring the database contents each time the database is updated or at any arbitrary timing, thereby eliminating the labor of exchanging functional information whenever communication is performed and enabling rapid text communication matching the capability of the other party.

It is the 33rd object according to the present application to collectively acquire functional information from an e-mail server for performing a distribution process, thereby enabling efficient acquisition of functional information, eliminating the labor of exchanging functional information, and enabling rapid text communication matching the capability of the other party.

It is the 34th object according to the present application to rapidly inform a user, in distributing e-mail by requesting an e-mail server to do so, of the transmission result by returning delivery confirmation when the e-mail data arrives at the distribution server, and allow the user to select the return of delivery confirmation when information is reliably distributed

to the destination if the information is important, thereby adding a user-friendly function meeting the need of the user.

A communication apparatus of the present

5 invention is an apparatus for transmitting/receiving e-mail data by connecting to the Internet, wherein when e-mail data having facsimile-format image data attached is to be communicated, communication concerning functional information is performed in addition to the

10 communication of the e-mail data.

A communication apparatus of the present invention comprises first connecting means for connecting to a local area network and/or second connecting means for connecting to a wide area network,

15 first communicating means for transmitting/receiving e-mail data by connecting to the Internet by one of the first and second connecting means, and second communicating means for performing facsimile communication by connecting to the wide area network by

20 the second connecting means, wherein communication concerning functional information is performed when the first communicating means communicates e-mail data having image data attached.

According to one aspect of the communication

25 apparatus of the present invention, if there is no response to the communication concerning functional

information from a communication partner apparatus with  
which the first communicating means communicates,  
e-mail data is sent to the first communicating means by  
attaching image data corresponding to the most common  
5 one of image data standards.

According to another aspect of the communication  
apparatus of the present invention, if there is no  
response to the communication concerning functional  
information from a communication partner apparatus with  
10 which the first communicating means communicates and if  
communication by the second communicating means is  
designated and the number of the other party is  
designated, the second communicating means communicates  
image data.

15 According to still another aspect of the  
communication apparatus of the present invention, if  
during the communication by the first communicating  
means a communication error occurs in communication of  
image data and in communication pertaining to delivery  
20 confirmation, retransmission is performed by selecting  
the number of times of retransmission from a plurality  
of individually preset numbers of times of  
retransmission including 0, in accordance with the  
contents of the communication error.

25 According to still another aspect of the  
communication apparatus of the present invention, no

retransmission is performed if the contents of the communication error indicate that there is no destination address.

- According to still another aspect of the

5 communication apparatus of the present invention, if a communication error occurs during the communication by the first communicating means, e-mail data describing information concerning communication error information is transmitted to the communication partner apparatus

10 or to a previously designated e-mail address.

According to still another aspect of the communication apparatus of the present invention, if a communication error occurs during the communication by the first communicating means, e-mail data having image data attached is transmitted to the communication

15 partner apparatus or a previously designated e-mail address.

According to still another aspect of the communication apparatus of the present invention, if a communication error occurs during the communication by the first communicating means, communication is performed in accordance with designation of whether transmission of e-mail by attaching image data by the most common one of image standards or retransmission is

20 to be performed.

25

According to still another aspect of the communication apparatus of the present invention, the most common one of image standards is an MH coding system considered to be essential of functional

5 information defined by ITU-T T.30, by which a resolution in a main scan direction is 8 pels/mm, a resolution in a sub-scan direction is 3.85 lines/mm, and an original width is 208 mm of A4 size.

According to still another aspect of the 10 communication apparatus of the present invention, if the form of connection to the first communicating means is dial-up connection, communication concerning functional information, communication of a text, and communication concerning delivery confirmation are 15 successively performed by a single call.

According to still another aspect of the communication apparatus of the present invention, if the form of connection to the first communicating means is dial-up connection, communication concerning 20 functional information, communication of a text, and communication concerning delivery confirmation are separately performed by at least two calls.

According to still another aspect of the communication apparatus of the present invention, if 25 the form of connection to the first communicating means is dial-up connection, communication concerning

functional information, communication of a text, and communication concerning delivery confirmation are successively performed by a single call or separately performed by different calls.

5        According to still another aspect of the communication apparatus of the present invention, if the form of connection to the first communicating means is dial-up connection, a line is once disconnected to wait for timeout processing in communication.

10      According to still another aspect of the communication apparatus of the present invention, if the form of connection to the first communicating means is dial-up connection, a line is once disconnected to wait for timeout processing in communication, and  
15      timeout is selectively verified by recall.

According to still another aspect of the communication apparatus of the present invention, functional information of a destination apparatus is acquired by communication using one of the first and  
20      second communicating means in the past, a database for holding a maximum capability supported by each function is registered or updated, and, if the first communicating means is to communicate data, the data is converted into a standard registered in the database  
25      and communicated.

According to still another aspect of the communication apparatus of the present invention, whether image data pertaining to the database is to be converted is set for each function item registered in 5 the database.

According to still another aspect of the communication apparatus of the present invention, if an address of the other party with respect to the first communicating means is input, display related to 10 functional information on an operation panel is switched on the basis of information in the database.

According to still another aspect of the communication apparatus of the present invention, if a communication error occurs in the first communicating 15 means, the second communicating means communicates image data if communication by the second communicating means is designated and a telephone number of the other party is set.

According to still another aspect of the 20 communication apparatus of the present invention, the apparatus further comprises means for acquiring function identification information of a transmission destination by looking up a database stored in connection with functional information in an e-mail 25 server connected by dial-up connection.

According to still another aspect of the communication apparatus of the present invention, when the first communicating means is to perform communication concerning the functional information, of 5 pieces of functional information defined by ITU-T T.30, functional information pertaining to communication such as a handshake rate, a modem rate, a minimum transmission time, the presence/absence of error correction mode, and the presence/absence of G4 10 function need not be exchanged.

A communication apparatus of the present invention comprises first communicating means for transmitting/receiving e-mail data by connecting to the Internet, and means for sending e-mail by attaching 15 image data by one of image standards which a communication partner is most likely to be able to process, if a communication error occurs when the first communicating means communicates e-mail data having image data attached.

20 A communication apparatus of the present invention comprises first communicating means for transmitting/receiving e-mail data by connecting to the Internet, means for designating an image format such as a resolution of image data, and means for requesting 25 functional information, pertaining to the designated image format, of the other party, wherein functional

information of the other party is not requested if the designated image format is an image format which the other party is most likely to be able to process.

A communication apparatus of the present

5 invention comprises first communicating means for transmitting/receiving e-mail data by connecting to the Internet, and an identifier for relating pieces of e-mail concerning pieces of functional information pertaining to the same process to each other, when the  
10 first communicating means is to communicate e-mail data having image data attached.

A storage medium of the present invention is a computer-readable storage medium storing a program for causing a computer to execute a first communication  
15 procedure of transmitting/receiving e-mail data by connecting to the Internet and a second communication procedure of performing facsimile communication by connecting to a wide area network, and storing a program for causing a computer to execute communication  
20 concerning functional information if the first communication procedure is to communicate e-mail data having image data attached.

According to one aspect of the storage medium of the present invention, the storage medium stores a  
25 program for causing a computer to send e-mail data by attaching image data corresponding to the most common

one of image data standards, if there is no response to the communication concerning functional information from a communication partner apparatus and performed by the first communication procedure.

5        According to another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to communicate image data by the second communication procedure, if there is no response to the communication concerning functional 10 information from a communication partner apparatus and performed by the first communication procedure and if communication by the second communication procedure and the number of the other party are designated.

According to still another aspect of the storage 15 medium of the present invention, the storage medium stores a program for causing a computer to perform retransmission, if during the communication by the communication procedure a communication error occurs in communication of image data and in communication 20 pertaining to delivery confirmation, by selecting the number of times of retransmission from a plurality of numbers of times of retransmission including 0, which are individually set in advance, in accordance with the contents of the communication error.

25        According to still another aspect of the storage medium of the present invention, the storage medium

stores a program for causing a computer to perform no retransmission if the contents of the communication error indicate that there is no destination address.

According to still another aspect of the storage  
5 medium of the present invention, the storage medium stores a program for causing a computer to transmit, if a communication error occurs during the communication by the first communication procedure, e-mail data describing information concerning communication error  
10 information to the communication partner apparatus or to a previously designated e-mail address.

According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to transmit, if  
15 a communication error occurs during the communication by the first communication procedure, e-mail data having image data attached to the communication partner apparatus or to a previously designated e-mail address.

According to still another aspect of the storage  
20 medium of the present invention, the storage medium stores a program for causing a computer to perform communication, if a communication error occurs during the communication by the first communication procedure, in accordance with designation of whether transmission  
25 of e-mail by attaching image data by the most common

one of image standards or retransmission is to be performed.

According to still another aspect of the storage medium of the present invention, the storage medium 5 stores a program for causing a computer to perform communication such that the most common one of image standards is an MH coding system considered to be essential of functional information defined by ITU-T T.30, by which a resolution in a main scan direction is 10 8 pels/mm, a resolution in a sub-scan direction is 3.85 lines/mm, and an original width is 208 mm of A4 size.

According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to successively 15 perform communication concerning functional information, communication of a text, and communication concerning delivery confirmation by a single call, if the form of connection by the first communication procedure is dial-up connection.

20 According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to separately perform communication concerning functional information, communication of a text, and communication concerning 25 delivery confirmation by at least two calls, if the

form of connection by the first communication procedure is dial-up connection.

According to still another aspect of the storage medium of the present invention, the storage medium 5 stores a program for causing a computer to successively perform or separately perform communication concerning functional information, communication of a text, and communication concerning delivery confirmation by a single call or by different calls, if the form of 10 connection by the first communication procedure is dial-up connection.

According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to once 15 disconnect a line to wait for timeout processing in communication, if the form of connection by the first communication procedure is dial-up connection.

According to still another aspect of the storage medium of the present invention, the storage medium 20 stores a program for causing a computer to once disconnect a line to wait for timeout processing in communication and selectively verify timeout by recall, if the form of connection by the first communication procedure is dial-up connection.

25 According to still another aspect of the storage medium of the present invention, the storage medium

stores a program for causing a computer to acquire functional information of a destination apparatus by communication using one of the first and second communication procedures in the past, register or  
5 update a database for holding a maximum capability supported by each function, and, if communication is to be performed by the first communication procedure, convert an image standard designated by a user into a standard registered in the database on the basis of  
10 information of the database and communicate the image.

According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to set whether image data pertaining to the database is to be  
15 converted for each function item registered in the database.

According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to switch  
20 display related to functional information on an operation panel on the basis of information in the database, if an address of the other party is input in the first communication procedure.

According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to communicate  
25

image data by the second communication procedure, if a communication error occurs in the first communication procedure and if communication by the second communication procedure is designated and a telephone 5 number of the other party is set.

According to still another aspect of the storage medium of the present invention, the storage medium having the communication function stores a program for causing a computer to execute a procedure of acquiring 10 function identification information of a transmission destination by looking up a database stored in connection with functional information in an e-mail server connected by dial-up connection.

According to still another aspect of the storage 15 medium of the present invention, the storage medium stores a program for causing a computer not to exchange, of pieces of functional information defined by ITU-T T.30, functional information pertaining to communication such as a handshake rate, a modem rate, a 20 minimum transmission time, the presence/absence of error correction mode, and the presence/absence of G4 function, when communication concerning functional information of a storage medium having the communicating function is to be performed by the first 25 communication procedure.

A storage medium of the present invention is a computer-readable storage medium storing a program for causing a computer to execute a first communication procedure of transmitting/receiving e-mail data by connecting to the Internet and a procedure of, if a communication error occurs while e-mail data having image data attached is communicated by the first communication procedure, sending e-mail by attaching the image data by one of image standards which the other party is most likely to be able to process.

A storage medium of the present invention is a computer-readable storage medium comprising a first communication procedure of transmitting/receiving e-mail data by connecting to the Internet, a procedure 15 of designating an image format such as a resolution of image data, and a procedure of requesting functional information, pertaining to the designated image format, of the other party, and storing a program for causing a computer not to request functional information of the 20 other party if the designated image format is an image format which the other party is most likely to be able to process.

A storage medium of the present invention is a computer-readable storage medium storing a program for causing a computer to execute a first communication procedure of transmitting/receiving e-mail data by

connecting to the Internet and a procedure of, when e-mail data having image data attached is to be communicated by the first communication procedure, relating pieces of e-mail concerning pieces of 5 functional information pertaining to the same process, e-mail of a text, and e-mail concerning delivery confirmation to each other.

According to still another aspect of the communication apparatus of the present invention, the 10 wide area network is one of PSTN and ISDN.

A communication method of the present invention comprises the first communication step of transmitting/receiving e-mail data by connecting to the Internet, and the step of sending, if a communication 15 error occurs while e-mail having image data attached is communicated in the first communication step, the e-mail by attaching the image data by one of image standards which the other party is most likely to be able to process.

20 A communication method of the present invention comprises the first communication step of transmitting/receiving e-mail data by connecting to the Internet, the step of designating an image format such as a resolution of image data, and the step of 25 requesting functional information, pertaining to the designated image format, of the other party, wherein if

the designated image format is an image format which the other party is most likely to be able to process, functional information of the other party is not requested.

5        A communication method of the present invention is a method of transmitting/receiving e-mail data by connecting to the Internet, wherein when e-mail data having facsimile-format image data attached is to be communicated, communication concerning functional  
10 information is performed in addition to the communication of the e-mail data.

      A communication system of the present invention is a communication system for transmitting/receiving e-mail data by a plurality of communication apparatuses  
15 connected to the Internet, wherein when e-mail data having facsimile-format image data attached is to be communicated between the communication apparatuses, communication concerning functional information is performed in addition to the communication of the  
20 e-mail data.

      A communication apparatus of the present invention comprises first connecting means for connecting to a local area network and/or second connecting means for connecting to a wide area network,  
25 first communicating means for transmitting/receiving e-mail data by connecting to the Internet by one of the

first and second connecting means, and means for receiving information on delivery confirmation by the first communicating means, wherein when the first communicating means communicates e-mail data having 5 image data attached, a communication result report is output which indicates one of information representing that communication of image information is successful, information representing that communication of image information has failed, information representing that a 10 communication result of image information is unverified, and information representing that the e-mail data has been communicated by attaching image data corresponding to the most common one of image data standards.

According to one aspect of the communication 15 apparatus of the present invention, the communication apparatus further comprises second communicating means for performing facsimile communication by connecting to the wide area network by the second connecting means.

According to another aspect of the communication 20 apparatus of the present invention, when the second communicating means performs communication, two types of communication result reports indicating information representing that communication of image information is successful and information representing that 25 communication of image information has failed are output.

A communication apparatus of the present invention comprises first communicating means for transmitting/receiving e-mail data by connecting to the Internet, and second communicating means for performing facsimile communication by connecting to a wide area network, wherein when the first communicating means communicates e-mail data having image data attached, a communication result report is output which indicates one of information representing that communication of image information is successful, information representing that communication of image information has failed, information representing that a communication result of image information is unverified, and information representing that the e-mail data has been communicated by attaching image data corresponding to the most common one of image data standards, and, when the second communicating means performs communication, a communication result report indicating one of information representing that communication of image information is successful and information representing that communication of image information has failed is output.

According to still another aspect of the communication apparatus of the present invention, the wide area network is one of PSTN and ISDN.

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A communication method of the present invention is a method of transmitting/receiving e-mail data by connecting to the Internet, wherein when e-mail data having image data attached is communicated, a  
5 communication result report is output which indicates one of information representing that communication of image information is successful, information representing that communication of image information has failed, information representing that a  
10 communication result of image information is unverified, and information representing that the e-mail data has been communicated by attaching image data corresponding to the most common one of image data standards.

A communication system of the present invention  
15 is a communication system for transmitting/receiving e-mail data by a plurality of communication apparatuses connected to the Internet, wherein when e-mail data having image data attached is communicated, the communication apparatuses output a communication result  
20 report indicating one of information representing that communication of image information is successful, information representing that communication of image information has failed, information representing that a communication result of image information is unverified,  
25 and information representing that the e-mail data has

been communicated by attaching image data corresponding to the most common one of image data standards.

A storage medium of the present invention is a computer-readable storage medium storing a program for 5 causing a computer to execute a procedure of the communication method described above.

A communication apparatus of the present invention comprises first connecting means for connecting to a local area network and/or second 10 connecting means for connecting to a wide area network, first communicating means for transmitting/receiving e-mail data by connecting to the Internet by one of the first and second connecting means, and a database for holding information pertaining to functional 15 information, wherein the first communicating means communicates e-mail data having image data attached.

According to one aspect of the communication apparatus of the present invention, the communication apparatus further comprises second communicating means 20 for performing facsimile communication by connecting to the wide area network by the second connecting means.

According to another aspect of the communication apparatus of the present invention, the communication apparatus has an e-mail address registration function 25 of registering an address of a communication partner and, when an e-mail address using the first

communicating means is registered in the e-mail address registration function, communication concerning functional information is performed with respect to a destination apparatus registered in the e-mail address 5 registration function, and the functional information is registered or updated with respect to an item, corresponding to the registered e-mail address, in the database.

According to still another aspect of the 10 communication apparatus of the present invention, in accordance with whether the form of connection to the first communicating means is dial-up connection via the wide area network or dedicated-line IP connection, whether communication concerning functional information 15 with respect to a communication partner apparatus registered in the e-mail address registration function is to be performed is individually set during registration of the e-mail address registration function.

20 According to still another aspect of the communication apparatus of the present invention, in accordance with whether the form of connection to the first communicating means is dial-up connection via the wide area network or dedicated-line IP connection, 25 communication concerning functional information is performed with respect to a communication partner

apparatus registered in the e-mail address registration function and, if no functional information of the communication partner apparatus is acquired, functional information corresponding to the most common one of 5 image data standards is registered, during registration of the e-mail address registration function.

According to still another aspect of the communication apparatus of the present invention, the communication apparatus further comprises means for 10 transmitting the contents of the database to a communication partner apparatus, the means notifying the communication partner apparatus of information registered in the database each time the database is updated or at any arbitrary timing.

15 According to still another aspect of the communication apparatus of the present invention, the communication apparatus further comprises means for transmitting the contents of the database to an e-mail server for distributing e-mail data to a connected 20 communication partner apparatus, the means notifying the e-mail server of information registered in the database each time the database is updated or at any arbitrary timing.

A communication system of the present invention 25 comprises a plurality of communication apparatuses each of which comprises first connecting means for

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connecting to a local area network and/or second connecting means for connecting to a wide area network, first communicating means for transmitting/receiving e-mail data by connecting to the Internet by one of the 5 first and second connecting means, and a database for holding information concerning functional information, and which communicates e-mail data having image data attached by the first communicating means, wherein on the basis of information about broadcast of a database 10 pertaining to the functional information from an e-mail server to which the plurality of communication apparatuses are connected and which distributes e-mail data to the plurality of communication apparatuses, the database of each communication apparatus is updated to 15 allow the plurality of communication apparatuses to share the contents of the databases.

According to one aspect of the communication system of the present invention, the communication system further comprises second communicating means for 20 performing facsimile communication by connecting to the wide area network by the second connecting means.

According to another aspect of the communication system of the present invention, when the e-mail server distributes e-mail data having facsimile image data 25 attached to the communication apparatus connected, delivery confirmation is returned to the communication

apparatus connected, without distributing the e-mail data having facsimile information attached to the communication apparatus or after the e-mail data is distributed to the communication apparatus, after the 5 e-mail server completes data reception.

A communication apparatus of the present invention comprises first communicating means for transmitting/receiving e-mail data by connecting to the Internet, means for designating an image format such as 10 a resolution of image data, and means for requesting functional information, pertaining to the designated image format, of a communication partner, wherein if functional information of the communication partner is known, the functional information of the communication 15 partner is not requested.

A communication apparatus of the present invention comprises first communicating means for transmitting/receiving e-mail data by connecting to the Internet, second communicating means for performing 20 facsimile communication by connecting to a wide area network, and a database for holding information concerning functional information, wherein the first communicating means communicates e-mail data having image data attached.

25 A storage medium of the present invention is a computer-readable storage medium storing a program for

causing a computer to execute a first communication procedure of transmitting/receiving e-mail data by connecting to the Internet and a second communication procedure of performing facsimile communication by  
5 connecting to a wide area network, and storing a program for causing a computer to search a database for information concerning functional information and communicate e-mail data having image data attached by the first communication procedure.

10 According to one aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to execute an e-mail address registration function for registering an address, and a program for causing a computer to  
15 perform communication pertaining to functional information, when an e-mail address is registered in the e-mail address registration function, with a communication partner apparatus registered in the e-mail address registration function, and register or  
20 update the functional information with respect to an item, corresponding to the registered e-mail address, in the database.

According to another aspect of the storage medium of the present invention, the storage medium stores a  
25 program for causing a computer to individually set, in accordance with whether the form of connection to the

Internet is dial-up connection via a wide area network or dedicated-line IP connection, whether communication concerning functional information with respect to a communication partner apparatus registered in the 5 e-mail address registration function is to be performed, during registration of the e-mail address registration function.

According to still another aspect of the storage medium of the present invention, the storage medium 10 stores a program for causing a computer to perform communication concerning functional information, in accordance with whether the form of connection to the Internet is dial-up connection via a wide area network or dedicated-line IP connection, with a communication 15 partner apparatus registered in the e-mail address registration function and, if no functional information of the communication partner apparatus is acquired, register functional information corresponding to the most common one of image data standards, during 20 registration of the e-mail address registration function.

According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to execute a 25 procedure of transferring the contents of the database to a communication partner apparatus, and a program for

causing a computer to notify another communication partner apparatus of information registered in the database each time the database is updated or at any arbitrary timing.

5        According to still another aspect of the storage medium of the present invention, the storage medium stores a program for causing a computer to execute a procedure of transferring the contents of the database to an e-mail server for distributing e-mail data

10      addressed to a communication partner apparatus connected, and a program for causing a computer to notify the e-mail server of information registered in the database each time a database of the communication partner apparatus is updated or at any arbitrary timing.

15      A communication system of the present invention comprises a communication apparatus which comprises first communicating means for transmitting/receiving e-mail data by connecting to the Internet, second communicating means for performing facsimile

20      communication by connecting to a wide area network, and a database for holding information concerning functional information, and which communicates e-mail data having image data attached by the first communicating means, wherein on the basis of

25      information about broadcast of a database pertaining to the functional information from an e-mail server to

which a plurality of the communication apparatuses are connected and which distributes e-mail data to the plurality of communication apparatuses, the database of each communication apparatus is updated to allow the 5 plurality of communication apparatuses to share the contents of the databases.

According to one aspect of the communication system of the present invention, when the e-mail server distributes e-mail data having facsimile image data 10 attached to the communication apparatus connected, delivery confirmation is returned to the communication apparatus connected, without distributing the e-mail data having facsimile information attached to the communication apparatus or after the e-mail data is 15 distributed to the communication apparatus, after the e-mail server completes data reception.

A storage medium of the present invention is a computer-readable storage medium storing a program for causing a computer to execute a first communication 20 procedure of transmitting/receiving e-mail data by connecting to the Internet, a procedure of designating an image format such as a resolution of image data, and a procedure of requesting functional information, pertaining to the designated image format, of the other 25 party, and a program for causing a computer not to

request functional information of the other party if the functional information of the other party is known.

According to still another aspect of the communication apparatus of the present invention, the 5 wide area network is one of PSTN and ISDN.

According to still another aspect of the communication system of the present invention, the wide area network is one of PSTN and ISDN.

A communication method of the present invention 10 is a method of transmitting/receiving e-mail data by connecting to the Internet, comprising the steps of designating an image format such as a resolution of image data, requesting functional information, pertaining to the designated image format, of a 15 communication partner apparatus, and if functional information of the communication partner is known, not requesting the functional information of the communication partner.

A communication method of the present invention 20 is a method of transmitting/receiving e-mail data by connecting to the Internet, comprising the steps of performing communication pertaining to functional information, when a mail address is registered in an e-mail address registration function, with a 25 communication partner apparatus registered in the e-mail address registration function, and registering

or updating the functional information with respect to an item, corresponding to the registered e-mail address, in a database.

According to one aspect of the communication  
5 method of the present invention, in accordance with whether the form of connection to the Internet is dial-up connection via a wide area network or dedicated-line IP connection, whether communication concerning functional information with respect to a  
10 communication partner apparatus registered in the e-mail address registration function is to be performed is individually set during registration of the e-mail address registration function.

According to another aspect of the communication  
15 method of the present invention, in accordance with whether the form of connection to the Internet is dial-up connection via a wide area network or dedicated-line IP connection, communication concerning functional information is performed with respect to a  
20 communication partner apparatus registered in the e-mail address registration function and, if no functional information of the communication partner apparatus is acquired, functional information corresponding to the most common one of image data  
25 standards is registered, during registration of the e-mail address registration function.

Other features and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which like reference characters designate 5 the same or similar parts throughout the figures thereof.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the system 10 configuration of an e-mail·facsimile exchanging apparatus;

Fig. 2 is a schematic view showing an example of the connection of the e-mail·facsimile exchanging apparatus to the Internet;

15 Fig. 3 is a schematic view showing another example of the connection of the e-mail·facsimile exchanging apparatus to the Internet;

Fig. 4 is a schematic view showing still another example of the connection of the e-mail·facsimile 20 exchanging apparatus to the Internet;

Fig. 5 is a flow chart showing the procedure of communication of e-mail having a facsimile image attached;

25 Fig. 6 is a flow chart showing the procedure of communication of e-mail having a facsimile image attached;

Fig. 7 is a flow chart showing the procedure of communication of e-mail having a facsimile image attached;

5 Fig. 8 is a flow chart showing the procedure of communication of e-mail having a facsimile image attached;

Fig. 9 is a flow chart showing the procedure of formation of a functional information database in one-touch button registration of the e-mail·facsimile  
10 exchanging apparatus;

Fig. 10 is a flow chart showing the procedure of acquiring functional information by operating a functional information key of an operation unit;

Fig. 11 is a flow chart showing the procedure  
15 when a change in functional information is communicated to a communication partner registered in a one-touch button or in an abbreviated button;

Fig. 12 is a schematic view showing one example  
of a communication management report by a G3 apparatus;  
20 and

Fig. 13 is a schematic view showing one example  
of a communication management report by an  
e-mail·facsimile apparatus.

25 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the present invention will be described in detail below with reference to the accompanying drawings.

Fig. 1 is a block diagram showing the system 5 configuration of an e-mail·facsimile exchanging apparatus of this embodiment.

Referring to Fig. 1, a bus 100-1 comprises address and data buses to which individual blocks to be described later are connected. This bus 100-1 10 transfers information between these blocks. A CPU 100-2 executes a computer program (software for controlling the whole apparatus) stored in a ROM 100-3 to control the e-mail·facsimile exchanging apparatus.

The ROM 100-3 is a read-only memory storing the 15 computer program to be executed by the CPU 100-2 and data such as fonts. A RAM 100-4 is a random memory for storing various data necessary for control, the states of software switches, and management data. A storage memory 100-5 is a file memory for storing coded image 20 data and e-mail data.

A line I/F unit 100-7 includes, e.g., a CCU (Communication Control Unit), modem, and NCU (Network Control Unit) for performing communication by connecting to an ISDN or PSTN. This line I/F unit 25 100-7 connects the line and communicates data under the control of the CPU 100-2. A reading unit 100-8 is an

image reader which scans an original and reads information of the original as image data. A printer unit 100-9 prints image data read via the reading unit 100-8, a LAN I/F unit 100-6, and the line I/F unit 5 100-7, or image data such as a report of management information formed by the CPU 100-2.

An operation unit 100-10 is a block functioning as a man-machine I/F of the e-mail·facsimile exchanging apparatus of this embodiment. This operation unit 10 100-10 has a display unit and various keys (not shown) and loads information input by a key and transfers various kinds of display information to be displayed on the display unit under the control of the CPU 100-2. A compressing/expanding unit 100-11 performs encoding and 15 decoding, e.g., compresses image data read by the reading unit 100-8 by encoding the data by any of various coding systems such as MH, MR, MMR, and JBIG, decodes encoded image data received by the line I/F unit 100-7 or the LAN I/F unit 100-6, and converts 20 codes of an image file on the storage memory 100-5 into codes required for communication.

The LAN I/F unit 100-6 is an interface for connecting to a LAN (Local Area Network) and has an interface such as Ethernet or FDDI. Via this interface 25 the LAN I/F unit 100-6 connects this e-mail·facsimile exchanging apparatus to the local area network.

Note that the ROM 100-3 stores bitmap data of fonts for converting character codes into bitmap image data when a text portion of e-mail data or a text portion of a communication management report is to be 5 converted into bitmap image data.

In this embodiment, the system configuration based on the existing facsimile apparatus is shown. However, a system can also be constructed by, e.g., a scanner, a printer, a display, a keyboard, and a modem 10 on the basis of a personal computer main body having a LAN interface or modem interface. When this is the case, a program for a communication function of the present application is supplied by an external storage medium such as a floppy disk.

15 Examples of the connection of the e-mail-facsimile exchanging apparatus of this embodiment to the Internet will be described below with reference to Figs. 2, 3, and 4. The e-mail-facsimile exchanging apparatus of this embodiment has a plurality 20 of forms of connections to the Internet, i.e., a dedicated-line IP connection and a dial-up connection, and communicates e-mail to another e-mail-facsimile exchanging apparatus or to a post office of an e-mail server by the most optimum method in accordance with 25 each form. Also, in accordance with an instruction the

e-mail·facsimile exchanging apparatus relays received image data to another G3 or G4 facsimile apparatus.

Usually, forms of connection between a LAN and the Internet are: a dedicated-line IP connection, as shown in Fig. 2, by which a LAN and the Internet always perform two-way communication via a dedicated line by using an IP router; and a dial-up connection, as shown in Fig. 4, by which a LAN and the Internet are connected by dial-up via a PSTN or ISDN as a public (wide-area) network (note that in Figs. 3 and 4, the e-mail·facsimile exchanging apparatus has a function of an ISDN router and connects a LAN to the Internet by dial-up).

Accordingly, the combinations of connections of  
15 the e-mail·facsimile exchanging apparatus of this  
embodiment and the Internet are: as shown in Fig. 2,  
the e-mail·facsimile exchanging apparatuses at both the  
transmitting and receiving ends are connected by  
dedicated-line IP connection via LANs; as shown in  
20 Fig. 3, one is connected by dedicated-line IP  
connection via a LAN, and the other is connected by  
dial-up connection via an ISDN/PSTN; and as shown in  
Fig. 4, both the transmitting and receiving ends are  
connected by dial-up connection via an ISDN/PSTN.

25 Note that in the dial-up connection, an e-mail  
POP3 (Post Office Protocol Ver. 3) server to which each

e-mail·facsimile exchanging apparatus and e-mail software of a PC (Personal Computer) connects is provided by an Internet provider (not shown) in the Internets 200-15, 300-13, or 400-11. Therefore, it 5 should be noted that in this dial-up connection the e-mail server and the e-mail·facsimile exchanging apparatus do not always exchange information.

Referring to Fig. 2, PCs 200-1 and 200-2 are personal computers connected to a LAN 200-16 and 10 exchange information via this LAN 200-16 with other PCs, an e-mail server 200-5, an e-mail·facsimile exchanging apparatus 200-7, and an IP router 200-9. Likewise, PCs 200-3 and 200-4 are personal computers connected to a LAN 200-17 and exchange information via this LAN 200-17 15 with other PCs, an e-mail server 200-6, an e-mail·facsimile exchanging apparatus 200-8, and an IP router 200-10.

The e-mail server 200-5 has the function of SMTP (Simple Mail Transfer Protocol)/POP3 and stores e-mail 20 addressed to each client in the LAN 200-6 into a corresponding post address that is set in the e-mail server 200-5.

In Figs. 2 and 3, the e-mail servers and the e-mail·facsimile exchanging apparatuses are separated. 25 However, each e-mail·facsimile exchanging apparatus can naturally have the function of the e-mail server.

Similarly, the e-mail server 200-6 has the function of SMTP/POP3 and stores e-mail addressed to each client in the LAN 200-17 into a corresponding post address that is set in the e-mail server 200-6.

5        The IP router 200-9 connects the LAN 200-16 to the Internet 200-15 and performs routing of an IP packet transmitted from a domain in the LAN 200-16 to the Internet 200-15 and an IP packet transmitted from the Internet 200-15 to a domain in the LAN 200-16.

10      Likewise, the IP router 200-10 connects the LAN 200-17 to the Internet 200-15 and performs routing of an IP packet transmitted from a domain in the LAN 200-17 to the Internet 200-15 and an IP packet transmitted from the Internet 200-15 to a domain in the LAN 200-17.

15      The e-mail·facsimile exchanging apparatus 200-7 is a communication apparatus as the characteristic feature of this embodiment and performs, by using the line I/F unit 100-7, facsimile communication using the G3/G4 protocol with other facsimile apparatuses 200-11  
20      and 200-12 connected to the ISDN/PSTN line. Also, this e-mail·facsimile exchanging apparatus 200-7 performs e-mail communication with the Internet 200-15 via the LAN 200-16 and the IP router 200-9 by using the LAN I/F unit 100-6. Analogously, the e-mail·facsimile  
25      exchanging apparatus 200-8 is a communication apparatus as the characteristic feature of this embodiment and

performs, by using the line I/F unit 100-7, facsimile communication using the G3/G4 protocol with the other facsimile apparatuses 200-11 and 200-12 connected to the ISDN/PSTN line. This e-mail-facsimile exchanging apparatus 200-8 also performs e-mail communication with the Internet 200-15 via the LAN 200-17 and the IP router 200-10 by using the LAN I/F unit 100-6.

The ISDN/PSTN 200-13 or 200-14 is a public network (ISDN or PSTN) for performing facsimile communication and telephone communication. Although the ISDN/PSTN 200-13 and the ISDN/PSTN 200-14 are separately depicted in Fig. 2, they can also be a single public network. The facsimile apparatuses 200-11 and 200-12 are connected to the public network (ISDN or PSTN) and communicate image data by the G3 or G4 protocol.

Fig. 3 is the same arrangement as in Fig. 2 except the connection between a LAN 300-14 and the Internet 300-13. Referring to Fig. 3, the LAN 300-14 is connected to an Internet provider (not shown) in the Internet 300-13, instead of being connected via an IP router as explained in Fig. 2, by dial-up connection performed by the line I/F unit 100-7 in an e-mail-facsimile exchanging apparatus 300-6 via an ISDN/PSTN 300-11.

To communicate e-mail, therefore, the e-mail-facsimile exchanging apparatus 300-6 connects by dial-up to an e-mail server (not shown) installed by the Internet provider in the Internet 300-13 and 5 communicates the e-mail via this e-mail server.

Also, the line I/F unit 100-7 of the e-mail-facsimile exchanging apparatus 300-6 performs facsimile communication with a facsimile apparatus 300-9 via the ISDN/PSTN 300-11, in addition to 10 connecting to the Internet.

Referring to Fig. 4, both LANs 400-12 and 400-13 are connected to the Internet via a public network (ISDN/PSTN).

Accordingly, when an e-mail-facsimile exchanging 15 apparatus 400-5 is to communicate e-mail, the line I/F unit 100-7 connects by dial-up with an e-mail server (not shown) installed by an Internet provider in the Internet 400-11 via an ISDN/PSTN 400-9 and communicates the e-mail. Similarly, when an e-mail-facsimile 20 exchanging apparatus 400-6 is to communicate e-mail, the line I/F unit 100-7 connects by dial-up with an e-mail server (not shown) installed by another Internet provider in the Internet 400-11 via an ISDN/PSTN 400-10 and communicates the e-mail.

25 A flow when e-mail having image data attached is communicated between e-mail-facsimile exchanging

apparatuses will be described in detail below. First, functional information will be described. G3 facsimile functional information is defined by DIS/DTC/DCS bits in ITU-T T.30 and includes information concerning image 5 data formats, information concerning facsimile services, and information about communication. Note that a sub-address, a password, and selective polling used in some facsimile service use information in an FIF (Facsimile Information Field) as 20 digits designated 10 by another FCF (Facsimile Control Field).

Table 1 shows the DIS/DTC/DCS functional information in ITU-T T.30 plus a few pieces of additional functional information by taking account of the case in which image data other than a facsimile image is attached in e-mail communication. In Table 1, the functional information pertaining to ITU-T T.30 is further divided into information concerning "image" that can be handled, "service", and "communication".

Table 1

Image	Coding system		MH,MR,MMR,JBIG,non-compression mode
	Resolu-tion	Main scan	8 pels/mm, 16 pels/mm 200 dpi, 300 dpi, 400 dpi, 600 dpi
		Sub-scan	3.85 lines/mm, 7.7 lines/mm, 15.4 lines/mm 200 dpi, 300 dpi, 400 dpi, 600 dpi
	Recording width	215 mm, 255 mm, 303 mm	
	Original Length	No limit, A4(297 mm), B4(364 mm)	
Service	Sub-address		20-DIGIT FIF (Confidential, Relay, Timer) in addition to presence/absence
	Password		20-DIGIT FIF in addition to presence/absence
	Selective polling		20-DIGIT FIF in addition to presence/absence
	File transfer		EDI,DTM,BTM,BFT
Communi-cation	Handshake	1200 bits/s, 2400 bits/s	
	Transfer rate	V.27ter 4800 bits/s 2400 bits/s	
		V.29 9600 bits/s 7200 bits/s	
		V.33 14,400 bits/s 12,000 bits/s	
		V.17 14,400 bits/s 12,000 bits/s	
		9600 bits/s 7200 bits/s	
		V.34 33,600 to 2400 bits/s (functional information is exchanged by V.34 not by T.30)	
	Minimum transmission time	40 ms, 20 ms, 5 ms, 0 ms	
	Error correction mode	Presence/absence	
	G4	Presence/absence	

Table 1 (Continued)

E-mail addition	Number of times of retransmission		
	Memory capacity		Block size of image data
	Application		Type·version of registered application
	Language environment		Japanese, English, French, Spanish, Portuguese, etc.
	Printer	Printer language	Printer language and version
	Resolution		180 dpi, 360 dpi, 720 dpi, 300 dpi, 400 dpi, 600 dpi, 1200 dpi
	Color·B/W		Depth (1.8, 16, 24, 32, 48)
	Color space		RGB, YUV, CMYK
	Sheet size		LTR, LEGAL, A3, A4, A5, B4, B5
	Sheet direction		LANDSCAPE, PORTRAIT
	Printing on both sides		Presence/absence
	Sorter		Presence/absence and function
	Finisher		Presence/absence and function

In the e-mail·facsimile exchanging apparatus of

5 this embodiment, functional information concerning 1) G3/G4 communication and functional information concerning 2) image and service are separately processed. The pieces of functional information pertaining to 2) image and service are switched by

10 changing software switches set in the RAM 100-4 of the apparatus and hence are substantially fixed to the

apparatus (the recording width and the like are frequently changed in accordance with loaded paper sheets in some e-mail·facsimile exchanging apparatuses, but this is not true if a sheet size changing function 5 is included).

Accordingly, when functional information is registered as a database in an e-mail·facsimile exchanging apparatus or e-mail server (including a dial-up connection destination) at the transmitting end 10 and image data is communicated on the basis of this database, it is unnecessary to exchange functional information in communication to an apparatus having the database. This is a particularly effective means when the e-mail·facsimile exchanging apparatuses are 15 connected by dial-up and so the communication cost increases if functional information is exchanged whenever communication is performed, or when a facsimile network is formed in a company or the like by using a relay function and a broadcast function. The 20 pieces of functional information pertaining to 1) G3/G4 communication are not particularly necessary in e-mail communication. Therefore, these pieces of functional information need not be exchanged in e-mail communication.

25 When the e-mail·facsimile exchanging apparatus transfers image data received by another G3/G4

facsimile apparatus by relay, functional information concerning the communication is exchanged between the e-mail-facsimile exchanging apparatus for relay and the G3 or G4 apparatus as a communication partner. Hence,  
5 exchange of the functional information concerning G3/G4 communication is unnecessary especially in e-mail communication.

Means for exchanging functional information and delivery confirmation information will be described  
10 below. A plurality of means are currently usable to exchange functional information as described below. The first means is a method of defining an information field pertaining to functional information and delivery confirmation as MIME type in e-mail, setting the pieces  
15 of functional information shown in Table 1 and the information concerning delivery confirmation in this field, and communicating the e-mail. The second means is a method of defining a functional information field and a delivery confirmation field in image data  
20 attached as a TIFF file, setting the pieces of functional information shown in Table 1 and information about delivery confirmation in these fields, and communicating e-mail by attaching the functional information as a TIFF file.

25 In these methods, e-mail pertaining to the same process is sometimes communicated as it is divided into

e-mail concerning exchange of functional information, e-mail concerning information of image data, and e-mail relating to delivery confirmation. Therefore, a specific ID is given to indicate that these pieces of e-mail are related to the same process, and the pieces of e-mail are identified as being related to the same process by this ID.

Still another means is to perform communication concerning exchange of functional information and 10 delivery confirmation by using the ESMTP as an extended protocol of the SMTP (Simple Mail Transfer Protocol). When this is the case, delivery confirmation is realized using the DSN (Delivery Status Notification) defined by the ESMTP. Note that the e-mail·facsimile 15 exchanging apparatus of this embodiment can use any of these means for functional information exchange and delivery confirmation.

The flow of communication of e-mail having a facsimile image attached will be described in detail below with reference to flow charts in Figs. 5, 6, 7, and 8. These flow charts can be used regardless of whether the connection form is dedicated-line IP connection or dial-up connection.

First, in step S100-1, communication of e-mail  
25 having image data attached is designated by a key  
operation from the operation unit 100-1 or by timer

activation by the CPU 100-2. In step S100-2, whether functional information corresponding to the designated e-mail address is registered in the database is checked. This database search can be performed for the database 5 that is set in the RAM 100-4 of the e-mail·facsimile exchanging apparatus of this embodiment or for the database on the e-mail server separately set as shown in Fig. 2.

If the functional information corresponding to 10 the address of the transmission destination is already registered in the database, the flow advances to step S100-3; if not, the flow advances to step S100-6. In step S100-3, the display contents of the operation unit 100-10 are changed on the basis of the looked-up 15 database. If the image data is already stored, the change of the display of the operation unit 100-10 in step S100-3 is skipped. In step S100-4, whether the functional information designated by the user or the formation of the stored image data is different from 20 the information of the looked-up database is checked. If YES in step S100-4, the flow advances to step S100-5, and the format of the image data is converted into any image format registered in the database.

Note that whether the process of collating the 25 database in step S100-4 is to be performed can be designated for each functional item. This is to give

the database flexibility by skipping collation of functional information not used depending on the mode.

If skip of functional information communication is designated in step S100-6, the process concerning 5 functional information communication is skipped, and the flow branches to step S100-25.

Skip of functional information is designated when a database of functional information is already included, such as when communication is performed by 10 relay or broadcast, or even if there is no such database, when exchange of functional information is unnecessary, such as when functional information used in communication is the most common one (e.g., a standard resolution or A4 size) of image data standards 15 as a base line.

When the functional information communication is not to be skipped, the flow advances to step S100-7 to start communicating the functional information. In step S100-8, an error in communication of this 20 functional information is monitored. If an error occurs, the flow branches to step S100-14. Also, in step S100-9 a response to the functional information communication is monitored by a timer (not shown). If timeout occurs, the flow similarly branches to step 25 S100-14.

1                    This timeout time can be individually set for  
2                    each transmission destination address or domain. This  
3                    is to handle a plurality of connection forms in which,  
4                    e.g., as shown in Figs. 2, 3, and 4, the transmission  
5                    destination is connected to an e-mail server by dial-up  
6                    connection or by a dedicated line, and the transmission  
7                    source is connected to an e-mail server by dial-up  
8                    connection or by a dedicated line. Especially in  
9                    dial-up connection, a response to functional  
10                    information extremely delays in some cases.

11                    When communication of the functional information  
12                    is normally done, the flow advances to step S100-10 to  
13                    newly register or update, where necessary, the database  
14                    concerning functional information of the other party.  
15                    If the e-mail-facsimile exchanging apparatus has no  
16                    e-mail server function as shown in Fig. 2, the updated  
17                    contents of this functional information database are  
18                    communicated to a separately installed e-mail server.

19                    If the e-mail-facsimile exchanging apparatus is  
20                    connected to the Internet by dial-up connection as  
21                    shown in Figs. 3 and 4, data concerning the update of  
22                    the internal database of the e-mail server need not be  
23                    retransmitted from the e-mail-facsimile apparatus. If  
24                    this is the case, the e-mail server can acquire  
25                    functional information communication data addressed to

the e-mail·facsimile exchanging apparatus and automatically update the database of this e-mail server.

Error processing from step S100-14 will be described below. If a communication error occurs in 5 step S100-8 or if a timeout error occurs in step S100-9, the flow advances to step S100-14. If in step S100-14 transfer communication of image data corresponding to the occurrence of an error is designated by G3/G4 transmission in accordance with settings of software 10 switches in the RAM 100-4, the flow advances to step S100-15 to communicate the image data stored in the storage memory 100-5 by G3/G4 communication by using the line I/F 100-7.

The telephone number used in this G3/G4 15 communication can be either the number of the e-mail·facsimile exchanging apparatus of this embodiment or the number of a G3/G3 dedicated machine in the same office. Also, this telephone number is set independently of the e-mail address. Note that as the 20 method of designating G3/G4 transfer communication, it is possible to use 1) a method of registering the telephone number and transfer designation in addition to the e-mail address in a one-touch dial or in an abbreviated dial, or 2) a method by which when a user 25 inputs the e-mail address and subsequently inputs the telephone number and instructs the start of

communication by key operation, G3/G4 transfer communication designation is set.

Alternatively, when a user inputs the telephone number and then inputs the e-mail address and instructs 5 the start communication by key operation, transmission of image data by G3/G4 communication is attempted. If this G3/G4 communication fails, communication by e-mail is performed in error processing.

If in step S100-16 base line designation upon 10 occurrence of an error is performed by designating base line conversion, the flow advances to step S100-17 to convert the stored image data into image data of the base line format. This is to deal with a case in which the communication partner is not an e-mail·facsimile 15 exchanging apparatus having functional information exchanging means but an e-mail user using a personal computer or an e-mail·facsimile exchanging apparatus having no functional information exchanging function.

If it is previously known that the transmission 20 destination is an apparatus having no functional information, base-line functional information is set in the database so that image data is restricted to the base line. Also, in step S100-6 skip of functional information communication is designated, and in step 25 S100-39 to be described later skip of delivery confirmation is designated. Consequently, image data

can be communicated without performing communication for exchange of functional information and exchange of delivery confirmation with respect to an apparatus having no functions of functional information exchange  
5 and delivery confirmation.

Note that the formation of the database for a base line is designated by key operation of a base-line key or the like, or the database is automatically formed in accordance with the contents of a  
10 communication error and timeout error in functional information exchange up to the point.

In step S100-18, whether it is set that information concerning the error is transmitted as text information to a specific e-mail address is checked.  
15 If YES in step S100-18, the flow advances to step S100-19 to transmit e-mail pertaining to the error information. Note that as the e-mail address herein set, the e-mail address of a user who has operated the communication, the e-mail address of the manager, or  
20 the e-mail address of the transmission destination is designated. Note also that this error information contains, e.g., the presence/absence of communication by the base line and the presence/absence of G3/G4 communication.  
25 The designation of error information communication can be individually set for each error

item and for each item such as the presence/absence of base-line communication and the presence/absence of G3/G4 communication. If necessary, error image data can be attached to e-mail pertaining to this error 5 information.

In step S100-20, the presence/absence of error report output designation is checked. If output of an error report is designated, in step S100-21 the error report is printed out. Similar to the transmission of 10 e-mail concerning error information, the error report output designation can be individually set for each error item and for each time such as the presence/absence of base-line communication and the presence/absence of G3/G4 communication.

15 In step S100-22, designation of whether image files stored in the storage memory 100-5 are to be erased is checked. If erasure of the image files is designated, the image files stored in the storage memory 100-5 are erased in step S100-3. As in the case 20 of the report output designation, this designation of erasure of image files can also be individually set for each error item and for each item such as the presence/absence of base-line communication and the presence/absence of G3/G4 communication.

25 In step S100-24, the error processing is completed.

A recall flow shown in Fig. 5 will be described below. This recall flow in steps S100-11, S100-12, and S100-13 is used when the e-mail·facsimile exchanging apparatus of this embodiment is connected to the 5 Internet or a local area network by dial-up connection.

If dial-up connection is found in step S100-11, the flow advances to step S100-12 to check whether calling is to be performed a plurality of times designated by software switches. If calling of a 10 plurality of times is designated, in step S100-13 the line is once disconnected after functional information communication is completed and recall is performed to communicate image data.

This can save the charge when, e.g., a certain 15 time is necessary between functional information communication and main image communication. Also, if a dial-up connection is used in the timeout error waiting process in step S100-9, it is possible to once disconnect the line, wait until a designated time 20 elapses, and reconnect the line to detect the presence/absence of timeout.

If no dial-up connection is found in step S100-11, the flow advances to step S100-25 shown in Fig. 7. In step S100-25, transmission of e-mail having image data 25 attached, i.e., main image communication is performed.

If necessary, image conversion is performed on the basis of newly acquired functional information.

Subsequently, a communication error and a timeout error are checked in steps S100-26 and S100-27,  
5 respectively. If either error has occurred, the flow branches to step S100-28 to search for retransmission designation and the number of times of retransmission from the contents of the error. If in step S100-29 retransmission is designated and the number of times of  
10 retransmission up to the point is less than the designated number of times of retransmission, the flow returns to step S100-25 to retransmit the main image. If retransmission corresponding to the error item is not designated or if a retransmission error has  
15 occurred a designated number of times, the flow advances to step S100-14. A flow from this step S100-14 is the same as the flow when an error occurs during functional information communication already described, so a detailed description thereof will be  
20 omitted.

If no error occurs in steps S100-26 and S100-27, the flow advances to step S100-30 shown in Fig. 8. In step S100-30, whether delivery confirmation is to be skipped is checked. If no delivery confirmation is  
25 necessary, the flow advances to step S100-39 to perform a normal termination process. If in step S100-39

erasure of image file data is designated, in step S100-40 image file data already transmitted and left in the storage memory 100-5 is erased. The flow then advances to step S100-41 to complete the communication.

5        If delivery confirmation is necessary, the flow advances to step S100-31. If it is found in step S100-31 that the e-mail·facsimile exchanging apparatus of this embodiment is connected to the Internet or a local area network by dial-up connection, the flow

10      advances to step S100-32 as in the case of functional information communication. If it is designated in step S100-32 that retransmission is to be performed a plurality of times designated by another software switch, in step S100-33 the line is once disconnected

15      after communication of the main image data is completed and recall is performed to communicate the image data. Likewise, although not shown in the flow chart, when a dial-up connection is employed, it is possible in the timeout error waiting process in step S100-27 to once

20      disconnect the line, wait until a designated time elapses, and reconnect the line to detect the presence/absence of timeout.

      In step S100-34, communication pertaining to delivery confirmation is performed. In steps S100-35  
25      and S100-36, a communication error and a timeout error are detected. As in the above case, when a dial-up

connection is employed, it is possible in the timeout error waiting process in step S100-36 to once disconnect the line, wait until a designated time elapses, and reconnect the line to detect the 5 presence/absence of timeout.

If an error or timeout concerning delivery confirmation communication occurs, the flow advances to step S100-37 to search for retransmission designation and the number of times of retransmission from the 10 contents of the error. If in step S100-38 retransmission is designated and the number of times of retransmission up to the point is less than the designated number of times of retransmission, the flow returns to step S100-25 to retransmit the main image. 15 If retransmission corresponding to the error item is not designated or if a retransmission error has occurred a designated number of times, the flow advances to step S100-14. From this step S100-14, the error processing described earlier is performed, and 20 the procedure is completed.

A flow of the formation of a functional information database in one-touch button registration of the e-mail·facsimile exchanging apparatus of this embodiment will be described in detail below with 25 reference to Fig. 9.

First, if in step S200-2 the e-mail address of the destination is set in a one-touch button or abbreviated button, the flow advances to step S200-3 to newly form or update a database corresponding to the 5 e-mail address registered in the one-touch button.

In step S200-3, whether registration concerning functional information is to be performed from the operation unit 100-10 is checked. If this registration is to be performed, the flow advances to step S200-6 to 10 acquire database information by the registration using the operation unit 100-10. The flow then advances to step S200-9 to register and update the database corresponding to the e-mail address registered in the one-touch dial.

15 Although the process is explained by taking a one-touch button or abbreviated button as an example, this process is similarly applicable to operations such as registration and update of registered e-mail addresses, by which destination names and destination 20 e-mail addresses are stored in one-to-one correspondence with each other. Also, although the formation of a functional information database in one-touch button registration of the e-mail·facsimile exchanging apparatus is described above, the process 25 can be applied to operations such as registration and update of e-mail addresses when an apparatus is

constituted by a system including a personal computer and the like. Furthermore, the process is applicable to deletion.

If no registration is performed in step S200-3,  
5 the flow advances to step S200-4 to check whether the apparatus is connected to the Internet by dial-up connection in accordance with software switches. If YES in step S200-4, the process is completed by skipping functional information communication and  
10 database update from step S200-5. This is to reduce the charge during dial-up connection. When a dial-up connection is employed, each e-mail·facsimile apparatus of this embodiment does not perform functional information communication and registration and update  
15 of the database. That is, each apparatus previously instructs an e-mail server at the destination of connection to form a database pertaining to functional information corresponding to the user address of the destination of one-touch registration.

20 The e-mail server exchanges functional information with respect to collectively newly registered e-mail addresses and registers and updates a database corresponding to the e-mail addresses. The e-mail·facsimile apparatus extracts the database  
25 information formed in the e-mail server to form a

database corresponding to the e-mail address registered in a one-touch button or an abbreviated button.

If no dial-up connection is employed, the flow advances to step S200-5 to perform communication for 5 functional information. The flow then advances to steps S200-7 and S200-8 to monitor a communication error and timeout during functional information communication. If there is a communication error or timeout, the flow advances to step S200-13 to perform 10 error processing, i.e., display the communication error on the operation unit 100-10 or send e-mail indicating the occurrence of the error to a preset e-mail address. After that, the process is completed. In the case of timeout, the other party may be a system having no 15 functional information exchanging function. If this is the case, a base-line function can be registered as functional information.

When normal functional information is acquired, the flow advances to step S200-9 to newly register or 20 update a database corresponding to the e-mail address. In step S200-10, whether communication of the contents of this database to another e-mail server in the LAN is designated by a software switch is checked. If YES in step S200-10, the flow advances to step S200-11 to 25 transmit to the e-mail server the database corresponding to the e-mail address of the server. On

the basis of the contents of the communication, the e-mail server registers or updates a database corresponding to the e-mail address.

Fig. 10 is a flow chart when a user acquires 5 functional information by operating a functional information key provided on the operation unit 100-11 separately from one-touch dials and abbreviated dials. If the functional information key is pressed in step S300-2, the flow advances to step S300-3 to communicate 10 functional information to the designated e-mail address and, as in the case of a one-touch dial, register and update a database corresponding to the designated e-mail address and inform the server of the results. Steps from step S300-4 are identical with steps from 15 step S200-7 in Fig. 9. This functional information key is primarily used when a database of e-mail addresses registered by one-touch dials is registered or updated at once, such as when one-touch registrations are collectively performed and communications concerning 20 functional information are collectively performed at a later time, or when a terminal is newly installed.

A procedure of communicating changes in 25 functional information to communication partners registered in one-touch buttons and abbreviated buttons when functional information of an e-mail·facsimile exchanging apparatus is changed by changing software

switches of the apparatus will be described below with reference to Fig. 11.

Note that the other parties to be informed of changes in functional information of an apparatus at 5 this end need not be all e-mail addresses registered in one-touch buttons and the like but can be individually designated e-mail addresses. In this flow shown in Fig. 11, when broadcast is performed by changing software switches, functional information of an apparatus at 10 this end is notified to the other party and at the same time functional information of the communication partner apparatus is acquired to update databases, in the apparatus at this end and in an e-mail server, of functional information pertaining to the destination 15 apparatus.

First, if software switches related to functional information of an apparatus are changed, the flow advances to step S400-3. If in step S400-3 communication of functional information resulting from 20 software switch change is designated by a separately set software switch, the flow advances to step S400-4 to communicate the functional information. If there is no designation, the flow advances to step S400-11 to complete the process. A functional information 25 communication flow from step S400-4 is already explained in Fig. 9, so a detailed description thereof

will be omitted. If software switches are changed, this change in functional information must be notified to a plurality of destinations. Therefore, in step S400-10 whether communication of functional information 5 to all destinations is completed is monitored. If this communication of functional information to all destinations is not completed, the flow returns to step S400-4 to keep communicating the functional information to the designated addresses until the functional 10 information communication to all destinations is completed.

Especially when a network is formed in a company or the like, functional information can be well exchanged by forming a database as shown in Figs. 9, 10, 15 and 11. Accordingly, communication can always be performed for a destination apparatus by optimum functions without exchanging functional information whenever communication is performed. Although not described in Figs. 9, 10, and 11, this database can 20 also be readily maintained by holding the date and time of update of the database for each registered e-mail address.

As has been explained above, transmitted e-mail is usually once stored in a post office set in an 25 e-mail server. After that, each user or e-mail·facsimile exchanging apparatus extracts the

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e-mail data from this e-mail server. Therefore, if the e-mail-facsimile exchanging apparatus has no e-mail step SMTP/POP3 server function, a separately set e-mail server must exchange delivery confirmation and exchange 5 functional information in place of the e-mail-facsimile exchanging apparatus. Hence, to set an e-mail server separately from the e-mail-facsimile exchanging apparatus, the capability of the e-mail-facsimile exchanging apparatus as a connection source and a 10 database of functional information pertaining to the communication partner must be set in the e-mail server.

When functional information databases of e-mail-facsimile exchanging apparatuses at this end and at a registered destination change, such as when 15 one-touch registration is performed, the functional information key is pressed, or software switches concerning functional information are changed, as shown in the flow charts of Figs. 9, 10, and 11, the e-mail-facsimile exchanging apparatus of this 20 embodiment transmits functional information related to the content of the change to an e-mail server having a corresponding post office. This allows the e-mail server to always hold information concerning the latest functional information by updating a corresponding 25 database on the basis of the transmitted functional information. In the case of dedicated-line IP

connection as shown in Fig. 2, communication of functional information and delivery confirmation can be performed by an e-mail·facsimile exchanging apparatus, not by an e-mail server.

5 An e-mail server is connected to a plurality of e-mail users and a plurality of e-mail·facsimile exchanging apparatuses. Therefore, databases of functional information concerning communication partners are transmitted and updated by a plurality of 10 e-mail·facsimile exchanging apparatuses. When this is the case, a functional information database can be shared by all apparatuses in a network by updating and changing the database of each apparatus on the basis of communication pertaining to a database broadcast at a 15 predetermined cycle from an e-mail server connected.

Figs. 12 and 13 show examples of communication management reports. Fig. 12 shows an example of a communication management report in conventional G3 apparatuses. Each communication result is indicated by 20 "OK" or "NG". Fig. 13 shows an example of a communication management report of the e-mail·facsimile exchanging apparatus of this embodiment. Each communication result is indicated by "OK", "NG", "BaseLine", "awaiting confirmation", or "G3/G4".

25 Unlike image transmission by G3/G4, communication of e-mail having image data attached takes time for a

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response to delivery confirmation communication. This frequently occurs when individual apparatuses are connected by dial-up. In the e-mail·facsimile apparatus of this embodiment, therefore, "awaiting acknowledgement" is added to the communication result report to inform the user of the status in which communication of main image data is completed but delivery confirmation is being awaited.

Also, as described previously, to communicate e-mail having image data attached to a destination apparatus having no functional information, the e-mail must be forcedly converted into a base-line image format before transmission. To notify a user of this information, "BaseLine" is added to the results of communication management in the e-mail·facsimile exchanging apparatus of this embodiment.

Furthermore, the e-mail·facsimile exchanging apparatus of this embodiment has a transfer communication function for automatically communicating image data by using the G3/G4 protocol if e-mail having an image attached cannot be transmitted owing to a communication error. To notify a user of this information, "G3/G4" indicating that G3/G4 communication has been performed is added to the results of communication management.

In the e-mail·facsimile exchanging apparatus of this embodiment, means for acquiring these communication management reports are as follows. That is, in accordance with any of an instruction by a user 5 from the operation unit 100-10, an external instruction via the LAN I/F unit 100-6 or the line I/F unit 100-7, and timer designation, the CPU 100-2 bitmaps communication management information into image data by using the fonts in the ROM 100-3 and causes the printer 10 unit 100-9 to print out the data. Alternatively, under the control of the CPU 100-2 e-mail of communication management report information is formed and communicated to a designated e-mail address.

Further, the present invention includes a case in 15 which program codes of software for realizing the functions of the abovementioned embodiment are supplied to an internal computer of a system or apparatus connected to various devices so as to operate these devices to realize the functions of the embodiment, and 20 these various devices are operated in accordance with the program stored in the computer (CPU or MPU) of the system or apparatus.

In this case, the program codes of the software accomplish the functions of the above embodiment, so 25 the program codes themselves and a means for supplying the program codes to the computer, e.g., a storage

medium storing the program codes, constitute the present invention. As this storage medium for storing the program codes, it is possible to use, e.g., a floppy disk, a hard disk, an optical disk, a  
5 magneto-optical disk, a CD-ROM, a CD-R, a magnetic tape, a nonvolatile memory card, and a ROM.

Furthermore, besides aforesaid functions according to the above embodiment are realized by executing the program codes by the computer, the  
10 present invention includes a case where the program codes achieve the functions of the embodiment in collaboration with an OS (Operating System) or some other application software running on the computer. The embodiment of the present invention naturally  
15 includes such program codes.

Furthermore, the present invention also includes a case where, after the supplied program codes are stored in a memory of a function extension board inserted into the computer or of a function extension  
20 unit connected to the computer, a CPU or the like of the function extension board or function extension unit performs a part or the whole of actual processing on the basis of instructions from the program codes and realizes the functions of the above embodiment.

25 The e-mail·facsimile exchanging apparatus of this embodiment can exchange functional information by an

optimum method in accordance with the form of connection to the Internet. Accordingly, in communication of facsimile images using e-mail, the capability of each apparatus function can be maximally utilized. This allows transmission/reception of information most effective to relay or broadcast to apparatuses having the G3 or G4 protocol.

This embodiment also provides a delivery confirmation exchanging means to an e-mail facsimile exchanging apparatus capable of communication in e-mail form. Therefore, it is possible to implement a communication apparatus capable of communication result acknowledgement, equivalent to that in facsimile communication using a public network, while recognizing the features of a network used by a user. Additionally, in e-mail data communication it is possible to distinguish between information indicating that base-line communication having no delivery confirmation information function and communication of image information are successful, and information indicating that the communication result of image information is unverified, in accordance with the status of arrival of delivery confirmation information. This can provide a user-friendly apparatus. Also, in e-mail data communication, it is possible to distinguish between information about the result of base-line communication

having no delivery confirmation information function and information about the result of communication having the delivery confirmation function.

As has been described above, the e-mail·facsimile apparatus of this embodiment can exchange functional information by an optimum method in accordance with the form of connection to the Internet. Accordingly, in communication of facsimile images using e-mail, the capability of each apparatus function can be maximally utilized. This allows exchange of information most effective to relay or broadcast to apparatuses having the G3 or G4 protocol.

This embodiment provides an e-mail·facsimile exchanging apparatus capable of communication in e-mail form with a database of information concerning a communication partner and functional information by optimum means in accordance with the form of connection to the Internet of an apparatus at each of the transmitting and receiving ends and with the installation state of e-mail server. Therefore, it is possible to realize image data communication equivalent to facsimile communication using a public network on e-mail communication, eliminate the labor of exchanging functional information whenever communication is performed, and perform rapid communication matching the capability of the other party.

Furthermore, when registration and update are performed for e-mail addresses frequently used by a user such as an e-mail address book function which stores one-touch buttons or abbreviated buttons,

5 destination names, and destination e-mail addresses in one-to-one correspondence with each other, communication concerning functional information is performed with respect to the registered destination apparatus and the result is stored in one-to-one

10 correspondence with the registered e-mail address. This eliminates the labor of exchanging functional information whenever the text of e-mail is communicated and allows rapid text communication matching the capability of the other party.

15 Additionally, whether communication pertaining to functional information is to be performed with respect to the destination apparatus is set in accordance with whether the connection to the Internet is dial-up connection or dedicated-line IP connection. This

20 permits a user to reduce the charge in dial-up connection.

If it is possible that the other party is a system having no functional information exchanging function, functional information of a base line is

25 registered. This eliminates the labor of exchanging functional information whenever the text of e-mail is

communicated and allows rapid text communication matching the capability of the other party.

Also, the contents of a functional information database are shared by other apparatuses. This 5 eliminates the labor of exchanging functional information and allows rapid text communication matching the capability of the other party.

Further, the contents of a functional information database are transferred whenever the database is 10 updated or at any arbitrary timing, thereby allowing the latest database contents to be shared by other apparatuses at any time. This eliminates the labor of exchanging functional information whenever communication is performed and allows rapid text 15 communication matching the capability of the other party.

Functional information can be collectively acquired from an e-mail server for performing a distribution process. This makes efficient acquisition 20 of functional information feasible, eliminates the labor of exchanging functional information, and allows rapid text communication matching the capability of the other party.

Furthermore, when e-mail is to be distributed by 25 requesting an e-mail server to do so, delivery confirmation is returned at the time the e-mail arrives

at the distribution server. Therefore, a user can be rapidly informed of the transmission result. When information is important, a user can select a return of delivery confirmation performed at the time the 5 information is certainly distributed to the distribution destination. Accordingly, it is possible to add a user-friendly function convenient for a user.

As many apparently widely different embodiments of the present invention can be made without departing 10 from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific embodiments thereof except as defined in the appended claims.

WHAT IS CLAIMED IS

1. A communication apparatus comprising:  
means for transmitting/receiving electronic mail data by connecting to the Internet; and

5 means for communicating the electronic mail data having facsimile-format image data attached by performing communication pertaining to functional information in addition to the communication of the electronic mail data.

10 2. A communication apparatus comprising:  
first connecting means for connecting to a local area network and/or second connecting means for connecting to a wide area network;  
first communicating means for  
15 transmitting/receiving electronic mail data by connecting to the Internet by one of said first and second connecting means; and  
second communicating means for performing facsimile communication by connecting to the wide area network by said second connecting means,  
20 wherein communication concerning functional information is performed when said first communicating means communicates electronic mail data having image data attached.

25 3. The apparatus according to claim 2, wherein if there is no response to the communication concerning

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functional information from a communication partner apparatus with which said first communicating means communicates, electronic mail data is sent to said first communicating means by attaching image data

5 corresponding to the most common one of image data standards.

4. The apparatus according to claim 2, wherein if there is no response to the communication concerning functional information from a communication partner

10 apparatus with which said first communicating means communicates and if communication by said second communicating means is designated and the number of the other party is designated, said second communicating means communicates image data.

15 5. The apparatus according to claim 2, wherein if during the communication by said first communicating means a communication error occurs in communication of image data and in communication pertaining to delivery confirmation, retransmission is performed by selecting

20 the number of times of retransmission from a plurality of individually preset numbers of times of retransmission including 0, in accordance with the contents of the communication error.

25 6. The apparatus according to claim 5, wherein no retransmission is performed if the contents of the

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communication error indicate that there is no destination address.

7. The apparatus according to claim 2, wherein if a communication error occurs during the communication by said first communicating means, electronic mail data describing information concerning communication error information is transmitted to said communication partner apparatus or a previously designated electronic mail address.

10 8. The apparatus according to claim 7, wherein if a communication error occurs during the communication by said first communicating means, electronic mail data having image data attached is transmitted to said communication partner apparatus or to a previously designated electronic mail address.

15 9. The apparatus according to claim 2, wherein if a communication error occurs during the communication by said first communicating means, communication is performed in accordance with designation of whether transmission of electronic mail by attaching image data by the most common one of image standards or retransmission is to be performed.

20 10. The apparatus according to claim 9, wherein the most common one of image standards is an MH coding system considered to be essential of functional information defined by ITU-T T.30, by which a

resolution in a main scan direction is 8 pels/mm, a resolution in a sub-scan direction is 3.85 lines/mm, and an original width is 208 mm of A4 size.

11. The apparatus according to claim 2, wherein if  
5 the form of connection to said first communicating  
means is dial-up connection, communication concerning  
functional information, communication of a text, and  
communication concerning delivery confirmation are  
successively performed by a single call.

10 12. The apparatus according to claim 2, wherein if  
the form of connection to said first communicating  
means is dial-up connection, communication concerning  
functional information, communication of a text, and  
communication concerning delivery confirmation are  
15 separately performed by at least two calls.

13. The apparatus according to claim 2, wherein if  
the form of connection to said first communicating  
means is dial-up connection, communication concerning  
functional information, communication of a text, and  
20 communication concerning delivery confirmation are  
successively performed by a single call or separately  
performed by different calls.

14. The apparatus according to claim 11, wherein if  
the form of connection to said first communicating  
25 means is dial-up connection, a line is once

disconnected to wait for timeout processing in communication.

15. The apparatus according to claim 11, wherein if the form of connection to said first communicating 5 means is dial-up connection, a line is once disconnected to wait for timeout processing in communication, and timeout is selectively verified by recall.

16. The apparatus according to claim 2, wherein 10 functional information of a destination apparatus is acquired by communication using one of said first and second communicating means in the past, a database for holding a maximum capability supported by each function is registered or updated, and, if said first 15 communicating means is to communicate data, the data is converted into a standard registered in said database and communicated.

17. The apparatus according to claim 16, wherein 20 whether image data pertaining to said database is to be converted is set for each function item registered in said database.

18. The apparatus according to claim 16, wherein if 25 an address of the other party with respect to said first communicating means is input, display related to functional information on an operation panel is switched on the basis of information in said database.

19. The apparatus according to claim 2, wherein if a communication error occurs in said first communicating means, said second communicating means communicates image data if communication by said second  
5 communicating means is designated and a telephone number of the other party is set.

20. The apparatus according to claim 2, further comprising means for acquiring function identification information of a transmission destination by looking up  
10 a database stored in connection with functional information in an electronic mail server connected by dial-up connection.

21. The apparatus according to claim 2, wherein when said first communicating means is to perform  
15 communication concerning the functional information, of pieces of functional information defined by ITU-T T.30, functional information pertaining to communication such as a handshake rate, a modem rate, a minimum transmission time, the presence/absence of error  
20 correction mode, and the presence/absence of G4 function need not be exchanged.

*¶.* A communication apparatus comprising:  
first communicating means for transmitting/receiving electronic mail data by  
25 connecting to the Internet; and

means for sending electronic mail by attaching  
image data by one of image standards which a  
communication partner is most likely to be able to  
process, if a communication error occurs when said  
5 first communicating means communicates electronic mail  
data having image data attached.

28. A communication apparatus comprising:  
first communicating means for  
transmitting/receiving electronic mail data by  
10 connecting to the Internet;  
means for designating an image format such as a  
resolution of image data; and  
means for requesting functional information,  
pertaining to the designated image format, of the other  
15 party,  
wherein functional information of the other party  
is not requested if the designated image format is an  
image format which the other party is most likely to be  
able to process.

20 24. A communication apparatus comprising:  
first communicating means for  
transmitting/receiving electronic mail data by  
connecting to the Internet; and  
an identifier for relating pieces of electronic  
25 mail concerning pieces of functional information  
pertaining to the same process to each other, when said

first communicating means is to communicate electronic mail data having image data attached.

25. A computer-readable storage medium storing a program for causing a computer to execute a first communication procedure of transmitting/receiving electronic mail data by connecting to the Internet and a second communication procedure of performing facsimile communication by connecting to a wide area network, and storing a program for causing a computer to execute communication concerning functional information if said first communication procedure is to communicate electronic mail data having image data attached.

26. The medium according to claim 25, wherein said storage medium stores a program for causing a computer to send electronic mail data by attaching image data corresponding to the most common one of image data standards, if there is no response to the communication concerning functional information from a communication partner apparatus and performed by said first communication procedure.

27. The medium according to claim 25, wherein said storage medium stores a program for causing a computer to communicate image data by said second communication procedure, if there is no response to the communication concerning functional information from a communication

partner apparatus and performed by said first communication procedure and if communication by said second communication procedure and the number of the other party are designated.

5 28. The medium according to claim 25, wherein said storage medium stores a program for causing a computer to perform retransmission, if during the communication by said communication procedure a communication error occurs in communication of image data and in

10 communication pertaining to delivery confirmation, by selecting the number of times of retransmission from a plurality of numbers of times of retransmission including 0, which are individually set in advance, in accordance with the contents of the communication error.

15 29. The medium according to claim 28, wherein said storage medium stores a program for causing a computer to perform no retransmission if the contents of the communication error indicate that there is no destination address.

20 30. The medium according to claim 25, wherein said storage medium stores a program for causing a computer to transmit, if a communication error occurs during the communication by said first communication procedure, electronic mail data describing information concerning

25 communication error information to said communication

partner apparatus or to a previously designated electronic mail address.

31. The medium according to claim 30, wherein said storage medium stores a program for causing a computer 5 to transmit, if a communication error occurs during the communication by said first communication procedure, electronic mail data having image data attached to said communication partner apparatus or to a previously designated electronic mail address.

10 32. The medium according to claim 25, wherein said storage medium stores a program for causing a computer to perform communication, if a communication error occurs during the communication by said first communication procedure, in accordance with designation 15 of whether transmission of electronic mail by attaching image data by the most common one of image standards or retransmission is to be performed.

33. The medium according to claim 32, wherein said storage medium stores a program for causing a computer 20 to perform communication such that the most common one of image standards is an MH coding system considered to be essential of functional information defined by ITU-T T.30, by which a resolution in a main scan direction is 8 pels/mm, a resolution in a sub-scan direction is 3.85 25 lines/mm, and an original width is 208 mm of A4 size.

34. The medium according to claim 25, wherein said storage medium stores a program for causing a computer to successively perform communication concerning functional information, communication of a text, and 5 communication concerning delivery confirmation by a single call, if the form of connection by said first communication procedure is dial-up connection.

35. The medium according to claim 25, wherein said storage medium stores a program for causing a computer 10 to separately perform communication concerning functional information, communication of a text, and communication concerning delivery confirmation by at least two calls, if the form of connection by said first communication procedure is dial-up connection.

15 36. The medium according to claim 25, wherein said storage medium stores a program for causing a computer to successively perform or separately perform communication concerning functional information, communication of a text, and communication concerning 20 delivery confirmation by a single call or by different calls, if the form of connection by said first communication procedure is dial-up connection.

37. The medium according to claim 34, wherein said storage medium stores a program for causing a computer 25 to once disconnect a line to wait for timeout processing in communication, if the form of connection

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by said first communication procedure is dial-up connection.

38. The medium according to claim 34, wherein said storage medium stores a program for causing a computer 5 to once disconnect a line to wait for timeout

processing in communication and selectively verify timeout by recall, if the form of connection by said first communication procedure is dial-up connection.

39. The medium according to claim 25, wherein said 10 storage medium stores a program for causing a computer to acquire functional information of a destination

apparatus by communication using one of said first and second communication procedures in the past, register or update a database for holding a maximum capability

15 supported by each function, and, if communication is to be performed by said first communication procedure, convert an image standard designated by a user into a standard registered in said database on the basis of information of said database and communicate the image.

20 40. The medium according to claim 39, wherein said storage medium stores a program for causing a computer to set whether image data pertaining to said database is to be converted for each function item registered in said database.

25 41. The medium according to claim 39, wherein said storage medium stores a program for causing a computer

to switch display related to functional information on an operation panel on the basis of information in said database, if an address of the other party is input in said first communication procedure.

5 42. The medium according to claim 25, wherein said  
storage medium stores a program for causing a computer  
to communicate image data by said second communication  
procedure, if a communication error occurs in said  
first communication procedure and if communication by  
10 said second communication procedure is designated and a  
telephone number of the other party is set.

43. The medium according to claim 25, wherein said storage medium having the communication function stores a program for causing a computer to execute a procedure 15 of acquiring function identification information of a transmission destination by looking up a database stored in connection with functional information in an electronic mail server connected by dial-up connection.

44. The medium according to claim 25, wherein said  
20 storage medium stores a program for causing a computer  
not to exchange, of pieces of functional information  
defined by ITU-T T.30, functional information  
pertaining to communication such as a handshake rate, a  
modem rate, a minimum transmission time, the  
25 presence/absence of error correction mode, and the  
presence/absence of G4 function, when communication

concerning functional information of a storage medium having the communicating function is to be performed by said first communication procedure.

48. A computer-readable storage medium storing a  
5 program for causing a computer to execute a first  
communication procedure of transmitting/receiving  
electronic mail data by connecting to the Internet and  
a procedure of, if a communication error occurs while  
electronic mail data having image data attached is

10 communicated by said first communication procedure,  
sending electronic mail by attaching the image data by  
one of image standards which the other party is most  
likely to be able to process.

49. A computer-readable storage medium comprising a  
15 first communication procedure of transmitting/receiving  
electronic mail data by connecting to the Internet, a  
procedure of designating an image format such as a  
resolution of image data, and a procedure of requesting  
functional information, pertaining to the designated  
20 image format, of the other party, and

storing a program for causing a computer not to  
request functional information of the other party if  
the designated image format is an image format which  
the other party is most likely to be able to process.

25 47. A computer-readable storage medium storing a  
program for causing a computer to execute a first

communication procedure of transmitting/receiving electronic mail data by connecting to the Internet and a procedure of, when electronic mail data having image data attached is to be communicated by said first communication procedure, relating electronic mail concerning pieces of functional information pertaining to the same process, electronic mail of a text, and electronic mail concerning delivery confirmation to each other.

5 48. The apparatus according to claim 2, wherein said wide area network is one of PSTN and ISDN.

10 49. A communication method comprising:  
the first communication step of  
transmitting/receiving electronic mail data by  
15 connecting to the Internet; and  
the step of sending, if a communication error occurs while electronic mail having image data attached is communicated in said first communication step, the electronic mail by attaching the image data by one of  
20 image standards which the other party is most likely to be able to process.

25 50. A communication method comprising:  
the first communication step of  
transmitting/receiving electronic mail data by  
connecting to the Internet;

the step of designating an image format such as a resolution of image data; and

the step of requesting functional information, pertaining to the designated image format, of the other 5 party,

wherein if the designated image format is an image format which the other party is most likely to be able to process, functional information of the other party is not requested.

10 ~~5X.~~ A communication method comprising the steps of:  
transmitting/receiving electronic mail data by connecting to the Internet; and  
performing communication concerning functional information, when electronic mail data having 15 facsimile-format image data attached is communicated, in addition to the communication of the electronic mail data.

20 ~~5X.~~ A communication system comprising:  
means for transmitting/receiving electronic mail data by a plurality of communication apparatuses connected to the Internet; and  
means for performing communication concerning functional information, when electronic mail data having facsimile-format image data attached is 25 communicated between said communication apparatuses, in

addition to the communication of the electronic mail data.

53. A communication apparatus comprising:  
first connecting means for connecting to a local  
5 area network and/or second connecting means for  
connecting to a wide area network;  
first communicating means for  
transmitting/receiving electronic mail data by  
connecting to the Internet by one of said first and  
10 second connecting means; and  
means for receiving information on delivery  
confirmation by said first communicating means,  
wherein when said first communicating means  
communicates electronic mail data having image data  
15 attached, a communication result report is output which  
indicates one of information representing that  
communication of image information is successful,  
information representing that communication of image  
information has failed, information representing that a  
20 communication result of image information is unverified,  
and information representing that the electronic mail  
data has been communicated by attaching image data  
corresponding to the most common one of image data  
standards.

25 54. The apparatus according to claim 53, further  
comprising second communicating means for performing

facsimile communication by connecting to the wide area network by said second connecting means.

5. The apparatus according to claim 54, wherein when said second communicating means performs communication, two types of communication result reports indicating information representing that communication of image information is successful and information representing that communication of image information has failed are output.

10 56. A communication apparatus comprising:  
first communicating means for transmitting/receiving electronic mail data by connecting to the Internet; and  
second communicating means for performing  
15 facsimile communication by connecting to a wide area network,  
wherein when said first communicating means communicates electronic mail data having image data attached, a communication result report is output which  
20 indicates one of information representing that communication of image information is successful, information representing that communication of image information has failed, information representing that a communication result of image information is unverified, and information representing that the electronic mail  
25 data has been communicated by attaching image data

corresponding to the most common one of image data standards, and, when said second communicating means performs communication, a communication result report indicating one of information representing that

5 communication of image information is successful and  
information representing that communication of image  
information has failed is output.

57. The apparatus according to claim 53, wherein said wide area network is one of PSTN and ISDN.

10 58. A communication method comprising the steps of:  
transmitting/receiving electronic mail data by  
connecting to the Internet; and  
outputting, when electronic mail data having  
image data attached is communicated, a communication  
15 result report which indicates one of information  
representing that communication of image information is  
successful, information representing that communication  
of image information has failed, information  
representing that a communication result of image  
20 information is unverified, and information representing  
that the electronic mail data has been communicated by  
attaching image data corresponding to the most common  
one of image data standards.

59. A communication system comprising:

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means for transmitting/receiving electronic mail data by a plurality of communication apparatuses connected to the Internet; and

means for outputting, from said communication apparatuses, when electronic mail data having image data attached is communicated, a communication result report indicating one of information representing that communication of image information is successful, information representing that communication of image information has failed, information representing that a communication result of image information is unverified, and information representing that the electronic mail data has been communicated by attaching image data corresponding to the most common one of image data standards.

60. A computer-readable storage medium storing a program for causing a computer to execute a procedure of the communication method according to claim 58.

61. A communication apparatus comprising:

20 first connecting means for connecting to a local area network and/or second connecting means for connecting to a wide area network;

first communicating means for transmitting/receiving electronic mail data by

25 connecting to the Internet by one of said first and second connecting means; and

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a database for holding information pertaining to functional information,

wherein said first communicating means communicates electronic mail data having image data 5 attached.

62. The apparatus according to claim 61, further comprising second communicating means for performing facsimile communication by connecting to the wide area network by said second connecting means.

10 63. The apparatus according to claim 61, wherein said apparatus has an electronic mail address registration function of registering an address of a communication partner and, when an electronic mail address using said first communicating means is registered in said 15 electronic mail address registration function, communication concerning functional information is performed with respect to a destination apparatus registered in said electronic mail address registration function, and the functional information is registered 20 or updated with respect to an item, corresponding to the registered electronic mail address, in said database.

25 64. The apparatus according to claim 63, wherein in accordance with whether the form of connection to said first communicating means is dial-up connection via said wide area network or dedicated-line IP connection,

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whether communication concerning functional information with respect to a communication partner apparatus registered in said electronic mail address registration function is to be performed is individually set during

5 registration of said electronic mail address registration function.

65. The apparatus according to claim 63, wherein in accordance with whether the form of connection to said first communicating means is dial-up connection via

10 said wide area network or dedicated-line IP connection, communication concerning functional information is performed with respect to a communication partner apparatus registered in said electronic mail address registration function and, if no functional information

15 of said communication partner apparatus is acquired, functional information corresponding to the most common one of image data standards is registered, during registration of said electronic mail address registration function.

20 66. The apparatus according to claim 61, further comprising means for transmitting the contents of said database to a communication partner apparatus, said means notifying said communication partner apparatus of information registered in said database each time said

25 database is updated or at any arbitrary timing.

67. The apparatus according to claim 61, further comprising means for transmitting the contents of said database to an electronic mail server for distributing electronic mail data to a connected communication 5 partner apparatus, said means notifying said electronic mail server of information registered in said database each time said database is updated or at any arbitrary timing.

68. A communication system comprising a plurality of 10 communication apparatuses each of which comprises first connecting means for connecting to a local area network and/or second connecting means for connecting to a wide area network, first communicating means for transmitting/receiving electronic mail data by 15 connecting to the Internet by one of said first and second connecting means, and a database for holding information concerning functional information, and which communicates electronic mail data having image data attached by said first communicating means, 20 wherein on the basis of information about broadcast of a database pertaining to the functional information from an electronic mail server to which said plurality of communication apparatuses are connected and which distributes electronic mail data to 25 said plurality of communication apparatuses, said database of each communication apparatus is updated to

allow said plurality of communication apparatuses to share the contents of said databases.

69. The system according to claim 68, further comprising second communicating means for performing 5 facsimile communication by connecting to the wide area network by said second connecting means.

70. The system according to claim 68, wherein when 10 said electronic mail server distributes electronic mail data having facsimile image data attached to said communication apparatus connected, delivery confirmation is returned to said communication apparatus connected, without distributing the electronic mail data having facsimile information attached to said communication apparatus or after the 15 electronic mail data is distributed to said communication apparatus, after said electronic mail server completes data reception.

X. A communication apparatus comprising:  
first communicating means for  
20 transmitting/receiving electronic mail data by connecting to the Internet;  
means for designating an image format such as a resolution of image data; and  
means for requesting functional information,  
25 pertaining to the designated image format, of a communication partner,

wherein if functional information of said communication partner is known, the functional information of said communication partner is not requested.

5 7. A communication apparatus comprising:  
first communicating means for transmitting/receiving electronic mail data by connecting to the Internet;  
second communicating means for performing  
10 facsimile communication by connecting to a wide area network; and  
a database for holding information concerning functional information,  
wherein said first communicating means  
15 communicates electronic mail data having image data attached.

7. A computer-readable storage medium storing a program for causing a computer to execute a first communication procedure of transmitting/receiving  
20 electronic mail data by connecting to the Internet and a second communication procedure of performing facsimile communication by connecting to a wide area network, and storing a program for causing a computer to search a database for information concerning  
25 functional information and communicate electronic mail

data having image data attached by said first communication procedure.

74. The medium according to claim 73, wherein said storage medium stores a program for causing a computer 5 to execute an electronic mail address registration function for registering an address of a communication partner, and

a program for causing a computer to perform communication pertaining to functional information, 10 when an electronic mail address is registered in said electronic mail address registration function, with a communication partner apparatus registered in said electronic mail address registration function, and register or update the functional information with 15 respect to an item, corresponding to the registered electronic mail address, in said database.

75. The medium according to claim 74, wherein said storage medium stores a program for causing a computer to individually set, in accordance with whether the 20 form of connection to the Internet is dial-up connection via a wide area network or dedicated-line IP connection, whether communication concerning functional information with respect to a communication partner apparatus registered in said electronic mail address 25 registration function is to be performed, during

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registration of said electronic mail address  
registration function.

76. The medium according to claim 74, wherein said  
storage medium stores a program for causing a computer  
5 to perform communication concerning functional  
information, in accordance with whether the form of  
connection to the Internet is dial-up connection via a  
wide area network or dedicated-line IP connection, with  
a communication partner apparatus registered in said  
10 electronic mail address registration function and, if  
no functional information of said communication partner  
apparatus is acquired, register functional information  
corresponding to the most common one of image data  
standards, during registration of said electronic mail  
15 address registration function.

77. The medium according to claim 73, wherein said  
storage medium stores a program for causing a computer  
to execute a procedure of transferring the contents of  
said database to a communication partner apparatus, and  
20 a program for causing a computer to notify  
another communication partner apparatus of information  
registered in said database each time said database is  
updated or at any arbitrary timing.

78. The medium according to claim 73, wherein said  
25 storage medium stores a program for causing a computer  
to execute a procedure of transferring the contents of

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    said database to an electronic mail server for  
    distributing electronic mail data addressed to a  
    communication partner apparatus connected, and a  
    program for causing a computer to notify said  
5     electronic mail server of information registered in  
    said database each time a database of said  
    communication partner apparatus is updated or at any  
    arbitrary timing.

76. A communication system comprising a communication  
10    apparatus which comprises first communicating means for  
    transmitting/receiving electronic mail data by  
    connecting to the Internet, second communicating means  
    for performing facsimile communication by connecting to  
    a wide area network, and a database for holding  
15    information concerning functional information, and  
    which communicates electronic mail data having image  
    data attached by said first communicating means,  
        wherein on the basis of information about  
        broadcast of a database pertaining to the functional  
20    information from an electronic mail server to which a  
    plurality of said communication apparatuses are  
    connected and which distributes electronic mail data to  
    said plurality of communication apparatuses, said  
    database of each communication apparatus is updated to  
25    allow said plurality of communication apparatuses to  
    share the contents of said databases.

80. The system according to claim 79, wherein when  
said electronic mail server distributes electronic mail  
data having facsimile image data attached to said  
communication apparatus connected, delivery  
5 confirmation is returned to said communication  
apparatus connected, without distributing the  
electronic mail data having facsimile information  
attached to said communication apparatus or after the  
electronic mail data is distributed to said  
10 communication apparatus, after said electronic mail  
server completes data reception.

81. A computer-readable storage medium storing a program for causing a computer to execute a first communication procedure of transmitting/receiving electronic mail data by connecting to the Internet, a procedure of designating an image format such as a resolution of image data, and a procedure of requesting functional information, pertaining to the designated image format, of the other party, and

20 a program for causing a computer not to request functional information of the other party if the functional information of the other party is known.

82. The apparatus according to claim 61, wherein said wide area network is one of PSTN and ISDN.

25 83. The system according to claim 68, wherein said wide area network is one of PSTN and ISDN.

84. The apparatus according to claim 71, wherein said wide area network is one of PSTN and ISDN.

85. A communication method of transmitting/receiving electronic mail data by connecting to the Internet,  
5 comprising the steps of:

designating an image format such as a resolution of image data;

requesting functional information, pertaining to the designated image format, of a communication partner  
10 apparatus; and

if functional information of said communication partner is known, not requesting the functional information of said communication partner.

86. A communication method of transmitting/receiving  
15 electronic mail data by connecting to the Internet,  
comprising the steps of:

performing communication pertaining to functional information, when a mail address is registered in an electronic mail address registration function, with a  
20 communication partner apparatus registered in said electronic mail address registration function; and

registering or updating the functional information with respect to an item, corresponding to the registered electronic mail address, in a database.

25 87. The method according to claim 86, wherein in accordance with whether the form of connection to the

Internet is dial-up connection via a wide area network or dedicated-line IP connection, whether communication concerning functional information with respect to a communication partner apparatus registered in said 5 electronic mail address registration function is to be performed is individually set during registration of said electronic mail address registration function.

88. The method according to claim 86, wherein in accordance with whether the form of connection to the 10 Internet is dial-up connection via a wide area network or dedicated-line IP connection, communication concerning functional information is performed with respect to a communication partner apparatus registered in said electronic mail address registration function 15 and, if no functional information of said communication partner apparatus is acquired, functional information corresponding to the most common one of image data standards is registered, during registration of said electronic mail address registration function.

89. The apparatus according to claim 12, wherein if the form of connection to said first communicating means is dial-up connection, a line is once disconnected to wait for timeout processing in communication. 20

90. The apparatus according to claim 12, wherein if the form of connection to said first communicating 25

means is dial-up connection, a line is once disconnected to wait for timeout processing in communication, and timeout is selectively verified by recall.

5 91. The apparatus according to claim 13, wherein if the form of connection to said first communicating means is dial-up connection, a line is once disconnected to wait for timeout processing in communication.

10 92. The apparatus according to claim 13, wherein if the form of connection to said first communicating means is dial-up connection, a line is once disconnected to wait for timeout processing in communication, and timeout is selectively verified by 15 recall.

93. The medium according to claim 35, wherein said storage medium stores a program for causing a computer to once disconnect a line to wait for timeout processing in communication, if the form of connection 20 by said first communication procedure is dial-up connection.

25 94. The medium according to claim 35, wherein said storage medium stores a program for causing a computer to once disconnect a line to wait for timeout processing in communication and selectively verify

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timeout by recall, if the form of connection by said first communication procedure is dial-up connection.

95. The medium according to claim 36, wherein said storage medium stores a program for causing a computer 5 to once disconnect a line to wait for timeout processing in communication, if the form of connection by said first communication procedure is dial-up connection.

96. The medium according to claim 36, wherein said 10 storage medium stores a program for causing a computer to once disconnect a line to wait for timeout processing in communication and selectively verify timeout by recall, if the form of connection by said first communication procedure is dial-up connection.

15 97. The apparatus according to claim 54, wherein said wide area network is one of PSTN and ISDN.

98. The apparatus according to claim 55, wherein said wide area network is one of PSTN and ISDN.

99. The apparatus according to claim 56, wherein said 20 wide area network is one of PSTN and ISDN.

100. The apparatus according to claim 72, wherein said wide area network is one of PSTN and ISDN.

ABSTRACT OF THE DISCLOSURE

Image data communication equivalent to facsimile communication using a public network is realized on e-mail communication. When a communication apparatus 5 for transmitting/receiving e-mail data by connecting to the Internet is to communicate e-mail data having facsimile-format image data attached, communication concerning functional information is performed in addition to the communication of the e-mail data. The 10 functional information can be exchanged by an optimum method matching the form of connection to the Internet. This allows maximum utilization of the capability of each apparatus function in facsimile image communication using e-mail.

FIG. 1

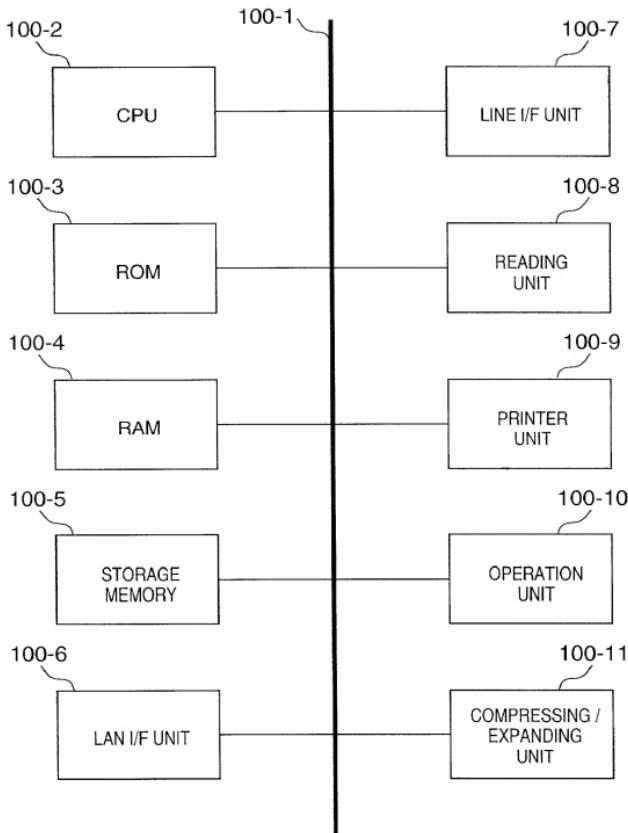


FIG. 2

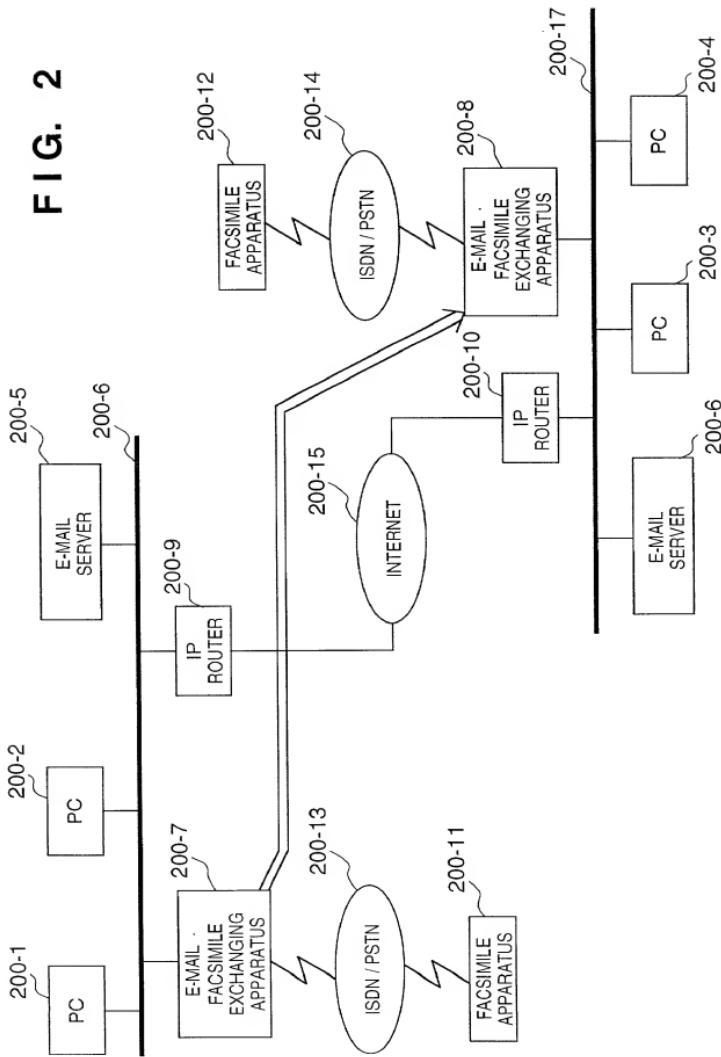


FIG. 3

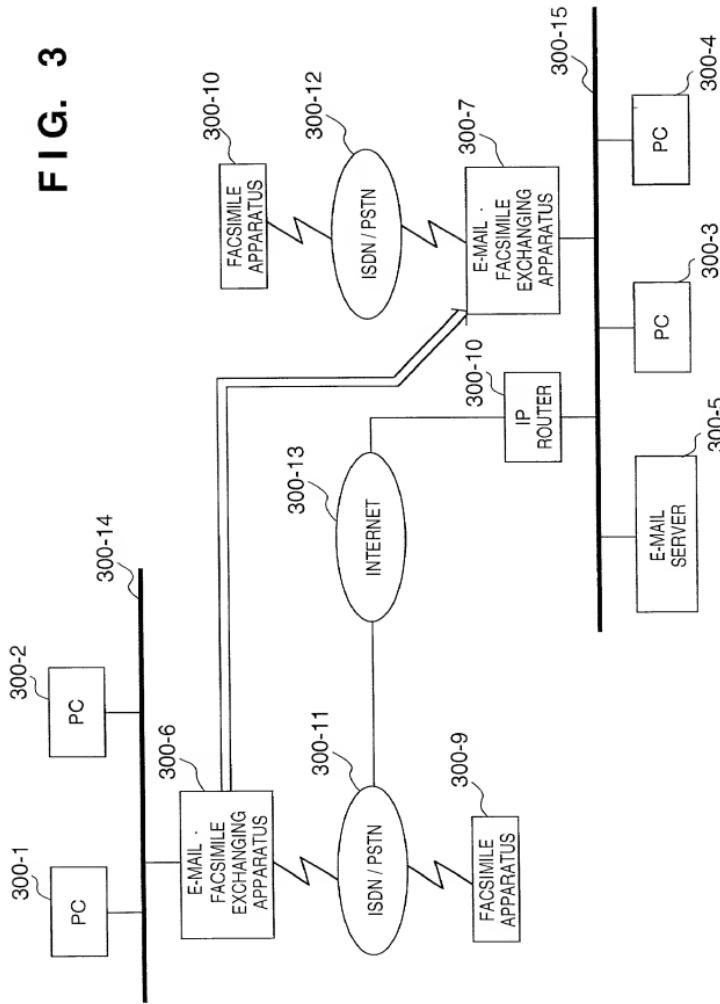
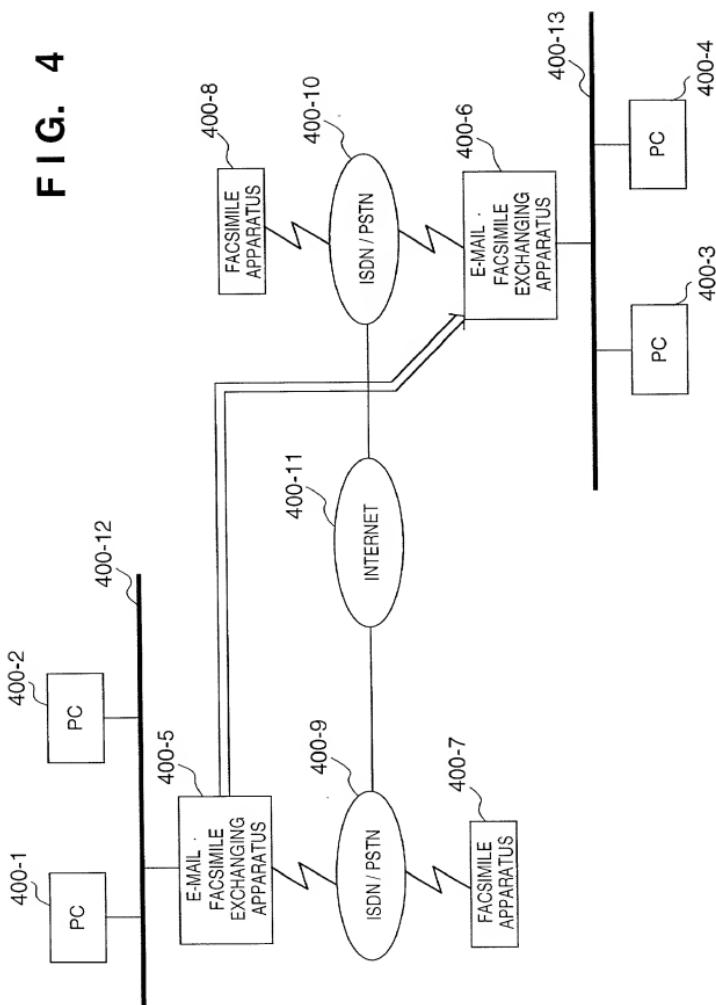


FIG. 4



**FIG. 5**

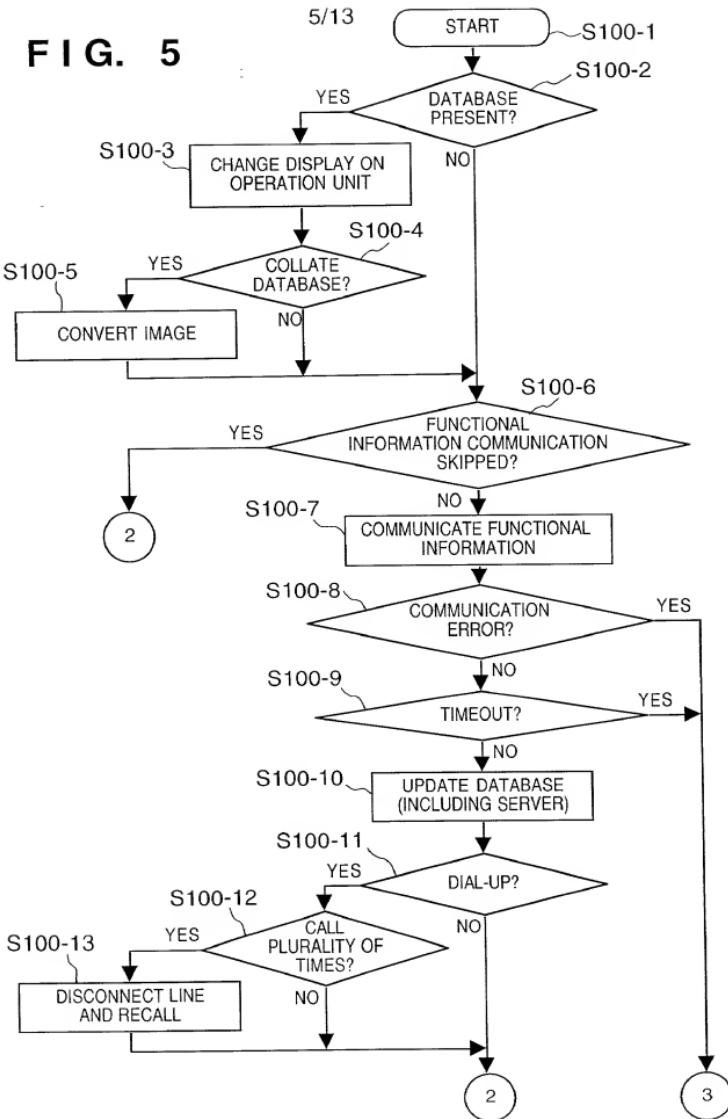


FIG. 6

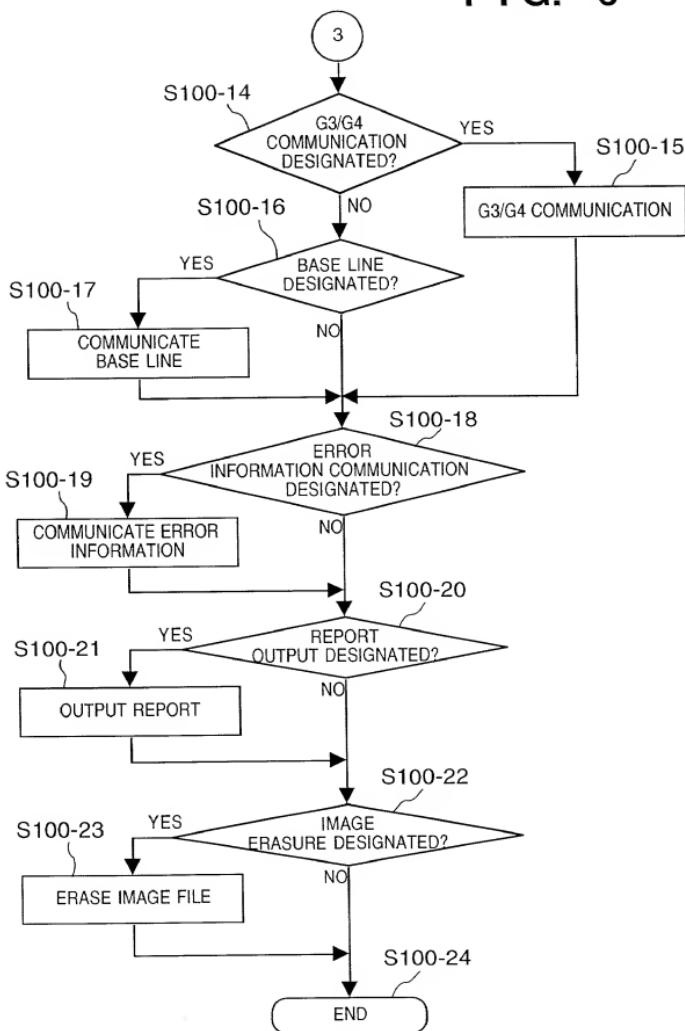
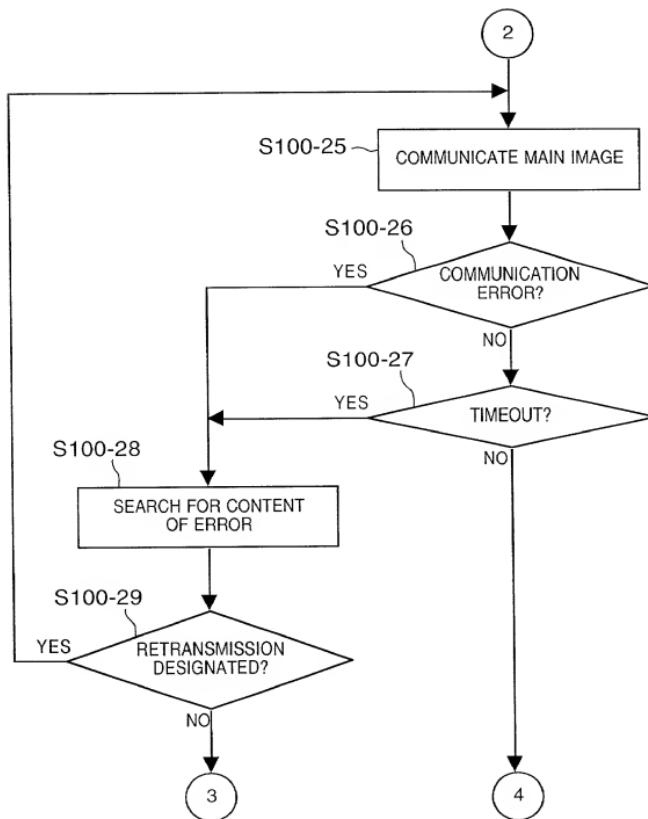


FIG. 7



**FIG. 8**

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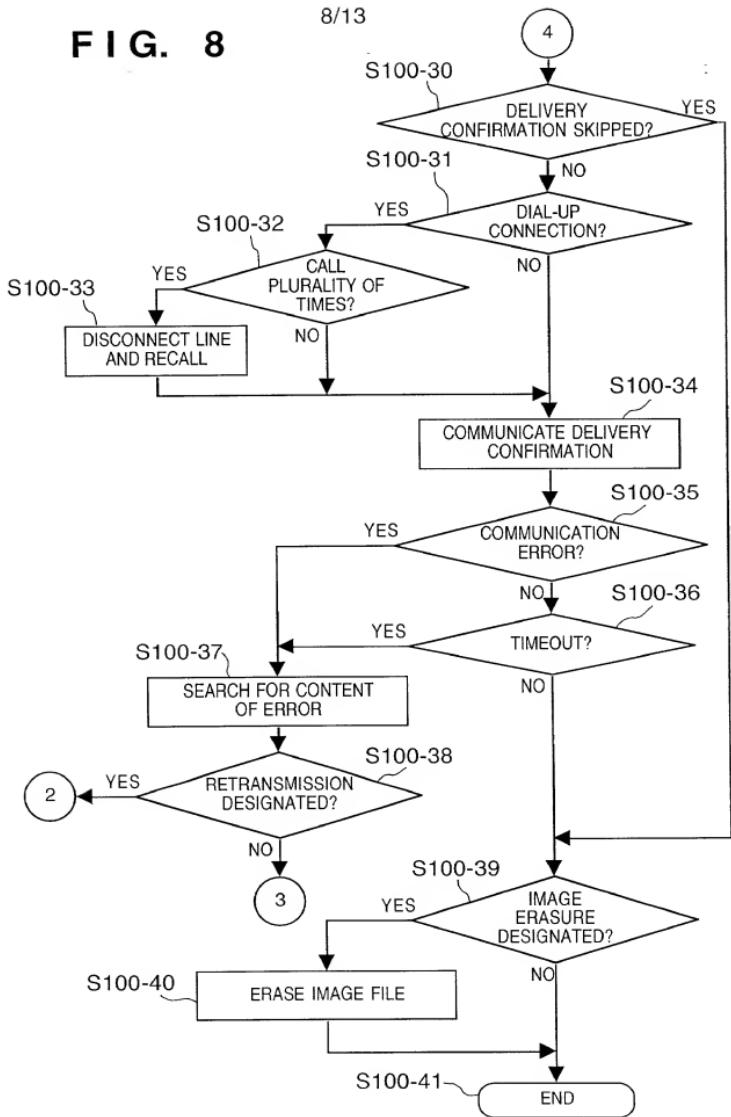


FIG. 9

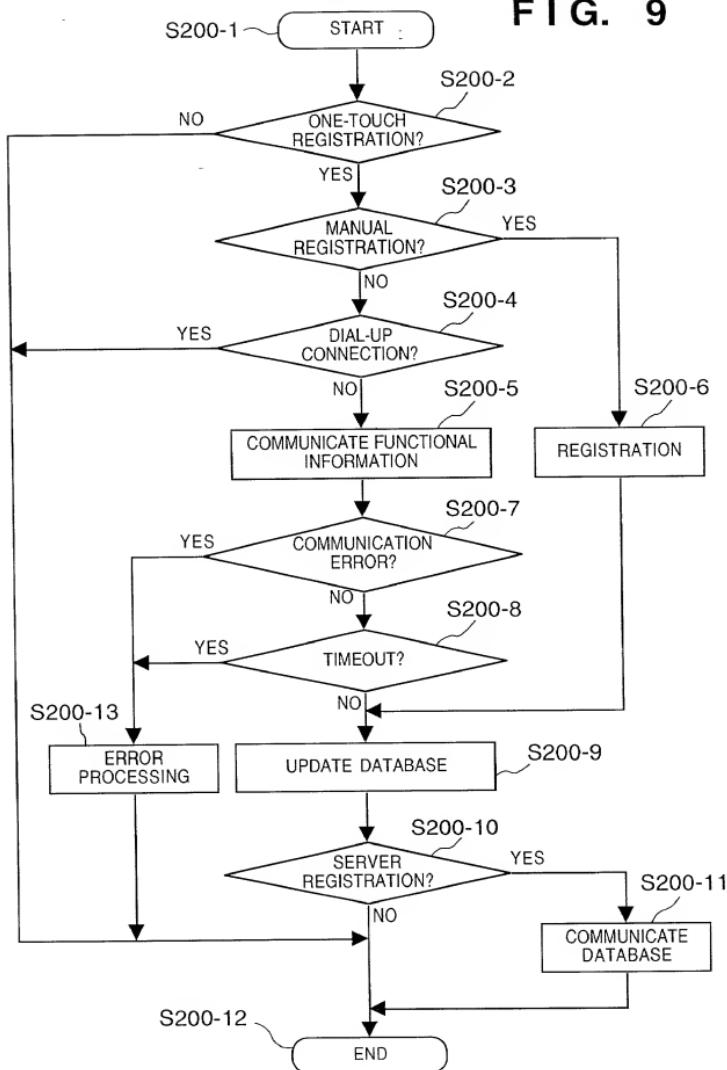


FIG. 10

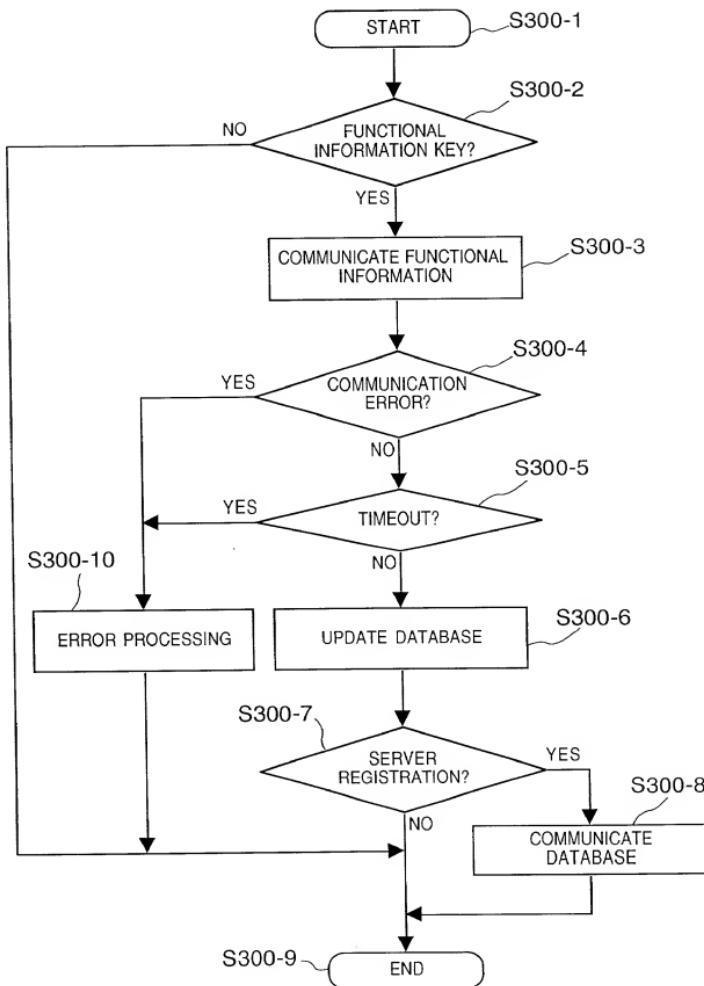
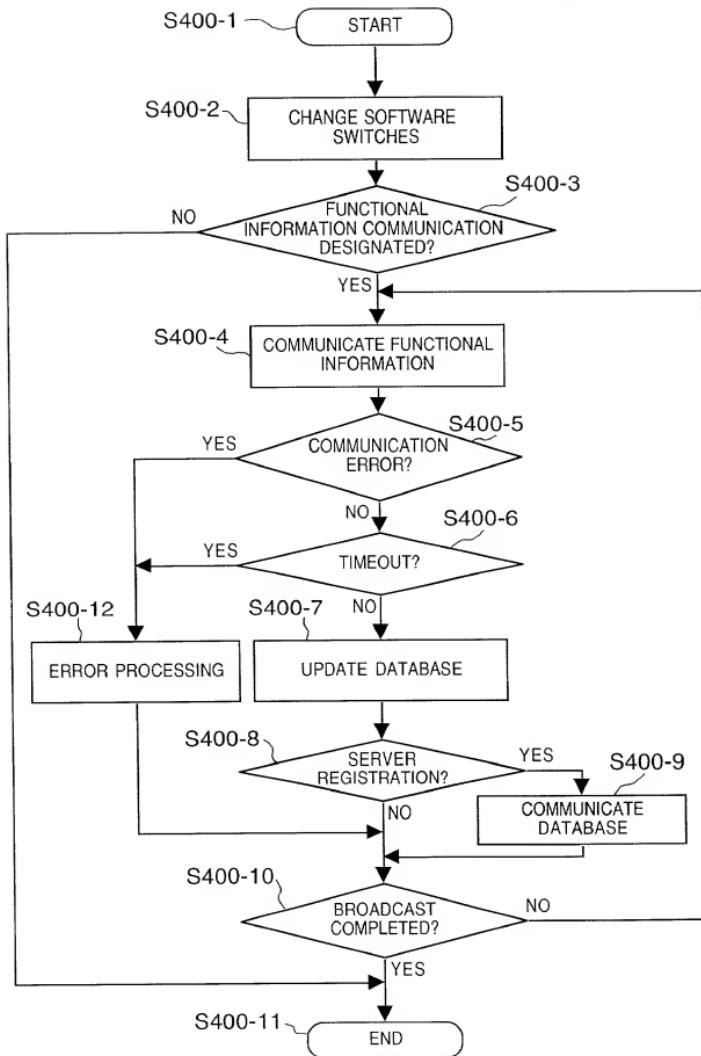


FIG. 11



## FIG. 12

\*\*\* COMMUNICATION MANAGEMENT REPORT \*\*\*

START TIME	OTHER PARTY	NUMBER	COMMUNICATION MODE	COMMUNICATION RESULT
02/04 17:03	0450000001	0001	TRANSMISSION	OK
02/04 17:20	0440000002	0002	TRANSMISSION	OK
02/04 18:30	0470000001	0003	ECM TRANSMISSION	NG #018
02/04 20:15	0520000001	0004	TRANSMISSION	OK
02/05 1:00	0471000001	5001	TRANSMISSION (TIMER)	NG #021
02/05 2:00	0350000001	5002	AUTOMATIC RECEPTION	OK
02/05 3:05	0300000001	0005	AUTOMATIC RECEPTION	OK

**FIG. 13**

START TIME	OTHER PARTY	NUMBER	COMMUNICATION MODE	COMMUNICATION RESULT
02/04 17:03	yyy@xxx.xx.xx	0001	MAIL TRANSMISSION	OK
02/04 17:20	zzz@xxx.xx.xx	0002	MAIL TRANSMISSION	Baseline
02/04 18:30	aaa@yyy.yy.yy	0003	MAIL TRANSMISSION	NG #018
02/04 20:15	bbb@yyy.yy.yy	0004	MAIL TRANSMISSION	OK
02/05 1:00	0471000001	5001	G3 TRANSMISSION (TIMER)	OK
02/05 2:00	0350000001	5002	G3 AUTOMATIC RECEPTION	OK
02/05 3:05	ccc@zzz.zzz.zzz	0005	RECEPTION	OK
02/07 6:00	0520000001	5004	G3 TRANSMISSION (ECM)	NG #021
02/07 7:05	/ddd@zzz.zzz.zzz	3012	MAIL TRANSMISSION	OK
02/07 9:00	0300000001	5005	G4 TRANSMISSION	OK
02/07 9:30	03000222222/ eee@zzz.zzz.zzz	3013	MAIL TRANSMISSION	G3

**COMBINED DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATION**  
(Page 1)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

COMMUNICATION APPARATUS, COMMUNICATION METHOD,

COMMUNICATION SYSTEM, AND STORAGE MEDIUM

the specification of which [ X ] is attached hereto. [ ] was filed on \_\_\_\_\_

as United States Application No. or PCT International Application No. \_\_\_\_\_

and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b), of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designates at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed:

<u>Country</u>	<u>Application No.</u>	<u>Filed (Day/Mo/Yr.)</u>	(Yes/No) <u>Priority Claimed</u>
JAPAN	11-165942	11/06/1999	Yes
JAPAN	11-187938	01/07/1999	Yes
JAPAN	11-187937	01/07/1999	Yes

I hereby appoint the practitioners associated with the firm and customer number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

**FITZPATRICK, CELLA, HARPER & SCINTO  
Customer Number: 05514**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor Katsutoshi USHIDA

Inventor's signature Katsutoshi Ushida

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